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A number of organisations like CARE (New Delhi), Protein Food Association (Bombay), National Institute of Nutrition (Hyderabad), CSIR Food Research Laboratory (Mysore), CHEB, Indian Pediatric Association (Calcutta), National Family Planning Institute (New Delhi) and others took active part in the Seminar. Our sincere thanks are extended to all the participating Institutes for having shown genuine interest and deputing very competent personnel.

It goes to the credit of Prof. B. Ganguly and Km. S. Mazumdar of the Department of Education in Science and Mathematics that as a result of their untiring effort the Seminar could be organised and the final report made ready.

New Delhi.

A.N. Bose
Head
Department of Education in
Science and Mathematics, NCERT.

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I Introduction and Brief Report

INTRODUCTION

Nutrition is regarded as the most vital problem of our country. The Planning Commission has rightly pointed out that all our plans and programmes are bound to be failure, if ill health due to malnutrition continues to cripple our citizens. In the society, when any kind of food is scarce and poverty is overwhelming it is essential to develop consciousness about nutrition such that whatever little resources we have does not go waste. The formation of such consciousness about nutrition is possible only at the school level when the children pass through the habit forming stage. Its success will largely depend upon the coordinated efforts of nutrition experts, curriculum planners, science educators, method masters and classroom teachers.

As a first step towards this coordinated activity, a National Seminar was organised on Nutrition Education at the Jadavpur University, Jadavpur from 15 to 21 October, 1974. The Department of Education in Science and Mathematics of NCERT was given the responsibility of organising this seminar and Department of Food Technology and Bio-Chemical Engineering, Jadavpur University collaborated in this effort. The participants included classroom teachers; Principals of Training College; Representatives from CARE, New Delhi; CFRL. Mysore; PFAI, Bombay; NIN, Hyderabad; ICCW, New Delhi and different Departments of States and Central Governments. Such participation of experienced and knowledgable persons from all over the country enriched the seminar. The well known physiologist Prof. Sachchidananda Banerjee, FNA Sc, presided over the function and Prof. A.N. Bose, Vice-Chancellor, Jadavpur University was the Chief Guest.

The present report includes the following components—*Proceedings of the Seminar, recommendations, different papers, objectives for all levels of school education and syllabuses of nutrition education for primary and middle level of school education.* If this material becomes the basis of solid nutrition education programme in the fifth five year plan, then the purpose of this seminar will be deemed as fruitful.

BRIEF REPORT

The seminar was inaugurated at 11.00 A.M. on 15 October 1974. Prof. Sunit Mukerjee, Head of the Department of Food Technology and Bio-Chemical Engineering, Jadavpur University as Local Director of the Seminar, welcomed the participants (names given in Annexure I). Prof. A.N. Bose, Head of the Department, Department of Education in Science and Mathematics, NCERT, New Delhi explained the different activities of NCERT and how the same machinery can be employed towards the implementation of nutrition education programme. Prof. B. Ganguly, (NCERT), Director of the Seminar explained the aims and objectives of the seminar. In his remarks, Prof. A. N. Bose, Vice Chancellor, Jadavpur University stressed on food habit and all careful planning of its consumption, balancing nutritional requirements and available food resources. He also emphasized that nutrition education should form an integral part of food policy. In his Presidential remarks, Prof. Sachchidananda Banerjee wanted to give a down to earth invigourating exposition of the major issues in the field of nutrition. He pointed out the total lack of knowledge on the part of nutritional custom. Dr. Amiya Bose, President, Indian Dietatic Association, emphasised the need for a comprehensive nutrition education programme starting from the pre-natal clinic and antenatal clinic, pre-school, primary and upto the education of the parents. Dr. Rajammal P. Devadas, Principal, Sri Avinashlingam Home Science College for Women, Coimbatore emphasized the need for the nutrition education at all levels and requested the participants to pinpoint the major problems in order to arrive at the final recommendations. Miss. S. Mazumdar of NCERT offered the vote of thanks.

The programme of the seminar consisted of two parts. In the first few days, participants coming from different areas of knowledge presented papers and exchanged views to develop a rationale. In the second part of the seminar on the basis of such agreed rationale, participants formulated general and specific objectives of nutrition education for all levels of school education. On the basis of these specific objectives, a syllabus was drafted for the training of both the target groups (Students) and the functionaries (teachers, method masters and science educators). The syllabus was drawn for primary and middle level. A separate syllabus was drawn for the training of method masters of training colleges and science educators. The following participants gave special lectures and read papers in the different sessions:—

1. *Special Lectures*
    - (i) Smt. L. Krishnamurthy (New Delhi)—Emphasis of projects on research methodology and community education.
    - (ii) Km. S. Mazumdar (New Delhi)—Science in primary school and nutrition education.
    - (iii) Prof. K. L. Mukherjee (Calcutta)—Nutrition and infection.
    - (iv) Dr. A. K. Bose (Calcutta)—Planning of Nutrition Education in the Country.
2. *Papers*
    - (i) Prof. S. Mukherjee (Jadavpur)—Major issues in Nutrition Education.
    - (ii) Dr. A. K. Sen (New Delhi)—Major issues in Nutrition Education.
    - (iii) Dr. B. Ganguly (New Delhi)—Nutrition Education in developed countries.
    - (iv) Dr. A.K. Sen (New Delhi)—Nutrition Education in developed countries.
    - (v) Mr. R. Mitra (Bombay)—Nutrition Education in developing countries.
    - (vi) Dr. P. K. Dutta (Calcutta)—Appraisal of Nutrition Education programme in India.
    - (vii) Smt. P. Rao (Hyderabad)—Nutrition Education in School: present position and future profile.
    - (viii) Prof. D. N. Ganguly (Calcutta)—Nutrition Education in School : present position and future profile.
    - (ix) S. K. Sur (Calcutta)—Nutrition Education in School : present position and future profile.
    - (x) Smt. R. P. Devadas (Coimbatore)—Nutrition Education in training colleges : its present position.
    - (xi) Smt. B. Sen (Calcutta)—Nutrition Education in training colleges its present position.
    - (xii) Dr. P. N. Sengupta (Calcutta)—Nutrition Education in training colleges : its present position.

(xiii) Km. K. Sawhany (New Delhi)—Interaction of society and schools in implementing nutrition education programme.

(xiv) Dr. (Smt.) Ira Ghosh (Calcutta)—Guidelines for impleing nutrition education at school and training college.

(xv) Smt. P. Sen (Calcutta)—Guidelines for implementing nutrition education at school and training college.

(xvi) Dr. Subhas Mukherjee (Calcutta)—Guidelines for implementing nutrition education at school and training college.

(xvi) Dr. S. S. Sekhon (Punjab)—Guidelines for implementing nutrition education at school and training college.

(xviii) Dr. D. K. Sinha (Jadavpur)—Guidelines for implementing nutrition education at school and training college.

RECOMMENDATIONS

1. Proper steps may be taken by NCERT or other agency to make an analysis of the prepared foods.
2. Nutrition education should be introduced as an elective in the curriculum for classes XI and XII.
3. Extensive training programmes should be organised for the teachers for making the nutrition education effective.
4. Food adulteration should be an important topic in nutrition education at all levels.
5. Nutrition education for teacher can be effective by making them conscious of the health of their own families.
6. The curriculum for the primary level should not be overloaded.
7. Diversified audio-visual aids should be used in the teaching.
8. NCERT may undertake a programme to devise teaching aids, reading materials, which may be utilized in these programmes.
9. Teachers' training colleges should consider employing home science or M.Sc. (nutrition) persons among the science method masters to teach nutrition and other sciences.
10. To make the teacher training effective separate paper on nutrition to be included and at least 60 periods should be allocated.
11. Extensive nutrition education training should be imparted through the special member institutes organised by NCERT. The venue could be home science colleges and such institutes where expertise in nutrition education is available.
12. The Directors of the member institutes should draw upon the resources from various agencies working in the field of nutrition.

II *Addresses and Papers*

WELCOME ADDRESS

Prof. Sunit Mukherjee, Jadavpur University, Jadavpur

On behalf of NCERT and Jadavpur University I most cordially welcome all of you to this Campus and to this National Seminar on Nutrition Education.

You know that this seminar has been organised primarily to develop syllabus and curricula for nutrition education in schools and teachers training colleges.

In a developing country like ours nutrition education has special significance particularly because situation in our country today is such that all available food resources should be most efficiently utilised. Present knowledge of nutrition is rapidly expanding, hence a wrong education might do more harm than that caused by ignorance.

Nutrition is a multi-disciplinary science. The disciplines involved are bio-chemistry, physiology, social science and other biological sciences. We have invited scientists from all areas. Our participants are members of various Medical colleges, Biochemistry departments of universities, Nutrition education and Extension departments of Government, Colleges of Home Economics, Social welfare and Philanthropic organisations and educators from universities and research institutions.

We hope that your participation and suggestions will make the objectives of the seminar successful and meaningful.

Those of you who have come from outside the city and are staying in the campus or elsewhere will be served by us for the next six days. Please fell free to inform us and our volunteers, if you have any problem any time.

I thank all of you for kindly devoting your time and efforts for the cause of the seminar.

INAUGURAL ADDRESS

Prof. A. N. Bose, Vice Chancellor, Jadavpur University, Jadavpur

Quest for food has been one of the most important factors determining the course of human history. Satisfaction of hunger is one of the principal aims of human activities. Men soon discovered that foods differ from one another in their nourishing value. It is not however, until rather recently, the full impact of the nutritive qualities of food on the health and welfare of man was realised. Research findings on the effect of malnutrition on child-mortality, on the frequency and severity of illness a person suffers, on physical fitness, on productivity and on mental development have alarmed the authorities entrusted with policy-decisions on foods for the people. It was once assumed that given the necessary educational opportunities and environmental conditions every child will grow into a bright, intelligent and productive member of the society. Modern knowledge of nutrition, however, points out that a child, deprived of adequate food in quantity as well as quality, will be handicapped in development and intelligence. Profound significance of such observations makes it imperative that food should be carefully chosen to meet the essential requirements of nutrition at every stage of development in a man's life. Matter has assumed added urgency due to limited availability of many articles of food and constraints of purchasing power. Nutrition education has to play an important role in this connection.

Food habits of people grow on availability of indigenous foods and are influenced by the climatic, socio-economic and cultural environment. Religious injunctions and often superstitions and ignorance affect the food habits significantly. In a society, particularly in a developing country like ours where the availability of food is limited by low purchasing power of the people, by inadequate agricultural production and by high rate of population growth, a careful planning of food consumption balancing the nutritional requirements and best use of available food resources is imperative. Nutrition education properly imparted, should considerably help in this exercise.

Nutrition education, I think, should give the students correct perspective about nutritional requirements of a person at different stages of his development and under the environmental conditions obtaining in the country. We quite often depend on the information and recommendations given by nutrition authorities in Western countries particularly in U.S.A. and convey, in our teaching, the same recommendations, to our students. There are sufficient evidence to suggest that these recommendations may have to be modified to reflect the correct nutrition requirements of people in different countries. In my opinion the most important aspect of nutrition education will be in the selection of indigenously available food materials to meet the nutritional requirements. In a country like ours, varieties of foods of vegetable and animal origin are available. People have an idea, not always correct or based on scientific analysis, about the nutritive value of such foods. Cases may be cited where a child has been nutritionally starved not because parents could not afford to provide it with proper food, but due to ignorance the child has been fed with foods which will not meet its nutritional requirement. In not too well-to-do families the earning members of family are given better food than what the child gets not knowing that the child is being permanently handicapped in growth both physically and mentally. The alteration of nutrition value of foods during preparation for serving requires special attention. An article of food may be rich in vitamins, but most of such vitamins may not be available due to destruction in cooking and in preparation for table. It is known that quality of protein of foods may be greatly altered by the cooking process. Unfortunately, teaching in nutrition does rarely deal with such alterations particularly for the types of cooking and preparations employed in Indian homes. Proper storage of foods in homes to retain their nutritive value to the maximum extent is another aspect often neglected. Whatever is taught is often unrelated to the conditions obtainable in the Indian homes. We may tell our students, that they should keep the perishable flod articles in refrigerators, but will this knowledge be helpful to him in his home? With increasing urbanisation, people have to depend more and more on foods which have been processed in factories. Different types of convenient foods and food formulations with emphasis on particular nutritive quality will appear in the market in increasing varieties and amounts. A correct appreciation of their true nature is necessary and such appreciation has to be based on basic knowledge about such foods. Such knowledge will on one hand prevent disappointment and wasteful expenditure and on the other hand will minimise exploitation of gulibility of common man by unscrupulous manufacturers and traders.

Nutrition education should form an integral part of country's food policy, because through such education best utilization of available resources for optimum nutrition of the people can be obtained. But such education is to be turned to the conditions obtaining in the country. Undiscerning copying of the West may only lead to snobbery and frustration. I presume this seminar on nutrition education in this country will be effective and purposeful.

PRESIDENTIAL ADDRESS

Prof. Dr. Sachchidananda Banerjee, Calcutta

It is a pleasure to be associated with the inaugural function of the National Seminar on Nutrition Education organised by the National Council of Educational Research and Training (NCERT). The objective of the seminar is to determine the meaningful goal, areas and syllabus of nutrition education at school level and Teachers' Training level. Scientists of various disciplines would participate to give a concrete shape to the objectives of the seminar.

A few years back when I was a Professor under the Education Department of the Government of West Bengal, text books on physiology and hygiene for school children used to be sent to me for my comments by the Director of Public Instruction, Government of West Bengal before their approval. I could notice the lack of knowledge of elementary principles on nutrition and dietetics in most of the authors. I had occasions to speak before a galaxy of Calcutta doctors of the Indian Medical Association on dietary treatment of diabetes. I could also see in them confused thinking about nutrition and dietetics. To curtail the consumption of carbohydrate in diabetes doctors often times prescribe preparation of wheat replacing rice with the idea that rice contains only carbohydrate and wheat principally contains protein. Rice, however, contains about 72 per cent carbohydrate whereas wheat contains about 68 per cent carbohydrate. Protein content of wheat is about 12 per cent while protein content of rice is 8 per cent. Equivalent unit of carbohydrate content per 100 gm. rice is present in 350 gm. potatoes, 350 gm. soyabeen, 125 gm. of pulses and 700 gm. of carrot. But diabetic ssubjects will not be allowed to eat potatoes in partial replacement of rice or wheat products.

Nutritional requirement as taught in most of the schools are sometimes based on data furnished from books published in Western countries. Studies carried out in India on nutrition are often times not known to Indian authors and so not included in books of nutrition written by them. Let us take the instance of calorie requirements. It has been shown by works carried out in different parts of India that FAO standards of calorie requirement is quite high and not applicable to Indians.

People have also confused ideas about protein requirement. Often times high protein diet are prescribed for children and adults for health without considering the total calorie requirement. If a diet is deficient in calories and contains plenty of protein the latter will be burnt to furnish energy to the body and not be available to body building purposes. Sometimes we speak of protein gap without taking into account the calorie deficiency. If calorie deficiency is corrected with carbohydrate the requirement of protein will be much less. Protein foods are costlier than carbohydrate rich foods. In the present days of spirally increasing food prices nutritional knowledge would be most important and economics of nutrition should be considered so as to get optimum nutrition with minimum cost.

I hope the organiser of this seminar would consider the few thoughts placed before them to evolve syllabus on nutrition education principally at Teachers' Training level who will be responsible to teach nutrition at the school level. I would suggest that the panel of experts to be formed for the preparation of different syllabi should include scientists of various disciplines namely nutritionists, physiologists, biochemists and medical practitioners. Attempts should also be made by the National Council of Educational Research and Training not only to formulate syllabus, but also to arrange publication of books in various regional languages.

I wish the seminar a grand success.

COMMENTS AT THE INAUGURAL SESSION

Dr. R. P. Devadas, Coimbatore

I am grateful for the honour of being invited by the distinguished Chairman, Dr. Sachchidananda Banerjee, and distinguished Vice Chancellor, Prof. A. N. Bose, to offer a few comments at this inaugural session where eminent educational. administrators, scholars, scientists, nutritionists and food technologists are present. This is a historic session, in that NCERT has come forward to put into action something which has been discussed at various conferences and forums—i.e., integration of nutrition education in the school curricula.

In our country we have adequate knowledge, experience and expertise to teach nutrition at all levels—from the ante-natal period to old age, but very few organisations or governments have so far implemented teaching nutrition as an integral part of the school programme at the elementary and secondary stages. Therefore, we are particularly grateful to NCERT for the opportunity extended to share our experiences and thoughts during the first three days of the seminar, and to formulate a concrete and comprehensive plan of curricula, contents, methods and training of teachers to introduce nutrition teaching in the three tiers as Dr. B. Ganguly of NCERT had pointed out.

In our institution at Sri Avinashilingam Home Science College, we have considerable practical experience in teaching nutrition at the pre-school, primary, secondary school, college and teacher education levels formally and in the community informally through extension and other action programmes. It will be privilege for me to share these experinces at this seminar. As an outcome of the seminar, we look forward to the launching of the nutrition education front in the field of general education in the country.

EMPHASIS OF PROJECTS ON RESEARCH METHODOLOGY AND COMMUNITY EDUCATION (ABSTRACT)

Smt. L. Krishnamurthy, CARE, New Delhi

CARE has conducted or is conducting different types of nutrition education projects, which may be included under following categories:—I *Community oriented projects*, and II *Structure oriented projects.*

1. *Community-oriented projects*

   (a) Using only mass media, directed at low income groups and aimed at creating nutrition awareness.

   (b) Using mass media and face to face extension methods directed at low income groups and aimed at creating nutrition awareness and understanding and perhaps change in habits.

1. a. *Community-oriented project using mass media*

The most important aspect of this project was the use of 'negative' and 'positive' themes. The negative theme used in Andhra Pradesh employed the shock treatment of frightening the target audience into taking interest in the subject being taught, i.e., we said to pregnant mothers, if you do not eat green leafy vegetables your child's future is in danger.

The positive theme used in Uttar Pradesh said, 'if you eat green leafy vegetables your child will be the brightest child in the village'.

Our messages were (a) pregnant women should eat green leafy vegetables, and (b) solids should be fed to infants from 6 months onwards.

These messages went down best in the negative treatment.

The media we used were posters, films, hoardings, pamphlets, radio and comics.

1. b. *Community-oriented projects using mass media and face to face extension services*

Two such programmes have been initiated.

(i) In Madras city slum areas.

(ii) In rural areas of Udiji Taluba of Karnataka State.

The common elements in these two projects are:

(i) The employment of local girls to act as educators.

(ii) The teaching of nutrition in its relation to sanitation and health. This is very important as for the low income groups these projects aim at, the interaction between nutrition, sanitation and health is very important.

(iii) Training the educators in *how to teach* is absolutely important.

2. *Structure-oriented projects*

We have initiated such projects in Madhya Pradesh, Uttar Pradesh and Orissa. Combinations of different media are used in the different states. The inputs are :—

(i) A diary-cum-manual.

(ii) Pamphlets.

(iii) Calendars.

The manual contains basic nutrition, sanitation and health data. The pamphlets (as in the community-oriented projects) have been framed in dialogue-cum-commentary terms. This was done after a certain amount of field research into what type of pamphlets go down best. A series of incidents related to nutrition sanitation and health, are depicted in the lives of 2 or 3 families made familiar over a series of 6—12 pamphlets.

The different CARE projects may be summed up in following lines :—

(1) The eduction is as much about nutrition as about sanitation and health.

(2) The education is tied down to reality. We talk not so much about proteins and carbohydrates as about energy giving foods, protective foods, etc.

(3) The education is for low-income groups and therefore does not advocate much expenditure above the usual on nutritious food, etc. Community-oriented programmes and school and teacher-training programmes should be co-ordinated at least as far as subject matter goes so that there is unity of purpose.

MAJOR ISSUES IN THE FIELD OF NUTRITION EDUCATION

Prof. Sunit Mukherjee, Jadavpur University, Jadavpur

Before we talk about nutrition we have to talk about food and food availability. Some people believe that if emphasis is given on food production and availability, nutrition can take care of itself barring a few exceptions.

People initially accept a food and not the nutrition part of it. A food is accepted by the population for the following four basic reasons:—

1. Cost.
2. Acceptability in terms of colour, flavour and texture.
3. Safety in terms of free from toxicity either chemical or bio-chemical or microbiological.
4. Nutrition in terms of the individual nutrients.

Unless all the above criteria are fulfilled, unless we can assure desirable cost, desirable acceptability, desirable safety, nutrition education may be a futile experiment. This has been a constant problem throughout the world particularly in developing countries while introducing new nutritious foods. Only after great efforts products like Incaparina and Pro-Nutro had some success.

There is no doubt that nutrition is required to be taught in schools. But a pragmatic approach should be made to frame out a suitable syllabus. Such education is supposed to be utilised in the personal life of the students and in the life of the community.

Some of the important items in nutrition education which is suggested to be included in school curricula are stated below:

1. The basic nutrition theory with regard to balanced food concept. The understanding of interdependence of individual nutrients. The effect of imbalance of one nutrient on utilisation of others.
2. Charts and tables containing the analysis of commonly available foods in the form of raw, processed, semi-processed cooked, overcooked, baked, fried, stored and packaged. As

most of the foods are not eaten fresh, this type of information is vitally important. The present books are not comprehensive. More data on the subject are required to be collected.

3. A model calculation showing how to determine the quantity of individual nutrients in a mixture of foods, when the analysis of individual foods are known. This will help to compare the food value of certain daily intake with the recommended dietary allowances.

SOME IMPORTANT ISSUES IN THE FIELD OF NUTRITION EDUCATION

Dr. A. K. Sen
National Institute of Family Planning,
New Delhi

Nutrition Education has assumed a great importance during the recent years. Its need is being increasingly felt in view of the rapid growth of population in the country and the lag in food production to meet the need and thereby endangering the health of the people. Nutrition is closely connected with the quality of the health of the population. The problem of nutrition has to be studied from various aspects such as biological, economical, sociological and psychological. Nutritional status of our children is far from satisfactory. The school provides an ideal situation for nutrition education to reach a large number of young population at the most formative periods of their lives. In this context, the present National Seminar on 'Nutrition Education' convened by National Council of Educational Research and Training is a significant one.

On the basis of relevant literature on nutrition education it is very much necessary to identify some important issues to facilitate discussion in this Seminar. A rational decision on these issues would help in developing a realistic approach and a practical plan of action for the introduction of nutrition education in the school curriculum. Some important issues are listed below for consideration in the Seminar.

Nutrition Education at School Stage

— Should Nutrition Education be introduced at all levels of school curriculum?

— What objectives should the school seek to attain through nutrition education?

— What is the present status of nutrition education in school?

— Will nutrition education become an integral part of different subjects in the school curriculum? If so, what are the subject areas available for inclusion at different stages?

- How should the curriculum on nutrition education be developed? Which agencies should be involved in such a programme?
- What strategy should be developed in introducing nutrition education in schools at various stages as education is a State subject ?
- What type of effective instructional materials including audio-visual aids would be needed for teaching the subject in school? How could these materials be developed quickly and made available to the students and the teachers?
- What steps should be taken to prepare the teachers in this regard?
- What agency at the State level would be needed to implement the programme quickly and effectively?
- What part can NCERT play as a co-ordinating agency in this regard?

Nutrition Education at Teacher Training Level

- What is the present position of nutrition education in the training schools and colleges? How should the curricula be modified if needed?
- What kind of pre-service training course would be desirable for teachers at different levels? What can the training schools and colleges do to prepare such a course? What is the role that SIE can play in such a programme?
- Would it be desirable to introduce a special paper on Nutrition Education at B.Ed., and M.Ed., levels for providing leadership in this important area? If so, how should it be developed?
- How should the orientation programme in this area be developed for a large number of teachers already employed? How could this work be done economically and effectively?
- What specific role NCERT is expected to play as the coordinating agency at the National level in this regard?

Some Other Important Issues

- What are the specific resistances that are likely to arise among the students, teachers and the educational administrators (Principals, inspectors, etc.), and how to overcome them?

— What is the responsibility of family in strengthening the nutrition education in the school? How should this be done?

— How would the society look at the programme? Would there be any resistance due to ignorance, religion, culture, etc.? What measures should be taken to overcome them?

— What effective part can Parent Teachers' Association play in the area of nutrition education?

— How could the different nutrition programmes of the country supplement the efforts of nutrition education in school?

— What are the specific roles that the voluntary agencies can play both at national and international level to promote the programme of nutrition education in schools?

— What should be the desirable time schedule for the programme from the stage of planning to the stage of implementation?

NUTRITION EDUCATION IN DEVELOPED COUNTRIES : HISTORIC RETROSPECT

Banku Ganguly
Department of Education in Science and Mathematics
NCERT; Sri Aurobindo Marg, New Delhi

The two terms "Nutrition" and "Food" have become synonymous to such an extent that majority of the people feel that abundance and availability of food alone can solve the nutritional problems. It means that the countries which have enough to eat, do not face the problems of nutrition. But truth is far from it. In spite of their affluence, all developed countries are very much concerned about the problems of nutrition and are careful in planning nutrition education for the school level. The purpose of this paper is to present briefly the historical account of nutrition which alone can reflect how the importance of nutrition education was felt.

The importance of food to the working of the living body was understood by man for a long time. All religions have given considerable important to the intake of proper food. Hippocrates, the Greek philosopher said, "Growing bodies have the most immense heat. They, therefore, require food, otherwise their bodies are wasted. In old men, the heat is feable and, therefore, they require little fuel;...." The experimental relationship of food with the working of human body was first provided by Van Helmont and Sanctorius. But what is understood today as nutrition came up only in the late 18th century, through the works of the French Scientist, Lavoisier, who is regarded as the father of both chemistry and nutrition.

In the early 19th century Magendie, for the first time classified food on the basis of its composition. The seat of nutritional studies were then in Germany. The works of Bidder, Schmidtt, Liebig and Voit helped us to know a lot about nutrition. In fact the students from Voit's laboratory spread in other countries to set up centres for nutritional studies.

The 20th century started with the coming of the first book on nutrition by Luck. On the basis of existing knowledge, Langworth formulated certain laws of human nutrition. But nothing was known about the cause-effect relationship between food and disease. The findings of Hopkins and Funks lead to the coming of many new findings along this line and it appeared that as if we are going to control all the diseases through food. A new technology, food technology was born and was very quickly strengthened. In all developed countries of today it appeared that battle against nutritional diseases and disorders are going to be won in the farm houses, drug stores and factories.

It took mankind to reach in the third quarter of 20th century, to realise that this affluence has conquered hunger but not nutrition. The unimaginative technological uses and lack of proper knowledge about nutrition have created more nutritional problems. It was revealed that people due to lack of proper knowledge have become the victim of half truth and quackery. Even in country like USA, entire food technology is going to be restructured and more stress is given on the nutrition education specially at the school level.

This example of debacle in developed countries should be a lesson to all the developing nations. Abundance of food may satisfy hunger, but cannot take care of nutrition. Proper nutrition education is necessary for both the "haves" and "have nots". The war agatnst nutritional problems can be won not in farm-houses or drug-stores, but in the millions of classrooms.

Some references about Nutrition Education

Arana, E. M.	1973	The basic principles of organic Nutrition related to gnathology, *The Journal of Applied Nutrition*, 25, 1 and 2, pp. 48.
Altschul, A. M.	1969	The Development of new Protein foods, *Development Digest*, 7, 1, pp. 17.
Berg, A. D.	1969	Malnutrition and National Development, *Development Digest*, 7, 1, pp. 3.
Berg, A. D. and F. J., Levinson	1969	Combating malnutrition: a working model, *Development Digest*, 7, 1, pp. 28.
Brown, L.	1967	The stork outruns the plow, *Development Digest*, 5, 2, pp. 31.
Carpenter, K. J. and V. H. Booth	1973	Damage to lysine in food processing, its measurement and its significance, Nutritional Abstracts and Reviews, *Commonwealth Bureau of Nutrition*, 43, 6, pp. 424.
Committee on International Programme, Food and Nutrition Board, NPS and NRC, USA.	1973	The relationship of malnutrition with brain development and behaviour, *Nutrition Reviews*, 31, 8, pp. 38.
Davis. K., and Presidents Science Advisory Committee	1969	The view on health and population problems, *Development Digest*, 7, 1, pp. 38.
Diehl, H. S. and W. Darlymple	1963	Healthful living (Text book of personal and community health) 9th edition,McGraw Hill, N.Y.
Food and Agricultural Organisation of the United Nations, Rome.	1969	The World Food Problem: Trade and Development, *Development Digest*, 7, 1, pp. 22.
Fischnich, O. E.	1967	The possibility of expanding food production by 1980, *Development Digest*, 5, 2, pp. 40.
Huff, P.	1973	Vitamin E, Natural? Mixed? Synthetic? *Journal of Applied Nutrition*, 25, 1, and 2, pp. 48.

Labuza, T. P.	1973	Effects of dehydration and storage on food, *Food Technology,* 27, 1, pp. 23.
Lachance, P. A.	1973	Effects of reheating process on foods, *Food Technology,* 27, 1, pp. 27.
Latham, M. C.	1965	Human nutrition in tropical Africa, FAO, The United Nations, Rome.
Livingstone, G. E.	1973	Effects of food service handling, *Food Technology,* 27, 1, pp. 25.
Lund, D. B.	1973	Desirable and undesirable effects of heat processing, *Food Technology,* 27, 1, pp. 21.
Oshima, H. T.	1969	Calories and productivity in Asian countries, *Development Digest,* 7, 1, pp. 25.
Pike, R. and M. L. Brown	1967	Nutrition: an integrated approach, John Wiley, New York.
Robson, J. R. K.	1972	Malnutrition : its causation and control Vols. 1 and 2 Ordon and Breach, Science Publishers, New York.
Raju, B.	1970	School health programme in selected middle schools of Delhi, National Council of Educational Research and Training, New Delhi.
Rosenfield, D.	1969	Amino acid fortification of staple foods, *Development Digest,* 7, pp. 11.
Scrimshaw, N. S.	1969	Infant malnutrition and adult learning, *Development Digest,* 7, pp. 20.
Stare, F. J.	1973	Nutrition up-to-date, *Food Technology,* 27, 1, pp. 14.
U.S. Dept. of Agriculture	1966	International agricultural development, May-Sept., pp. 205.
William. R.	1971	Nutrition against disease, Pittman Publishing Company, New York.
WHO	1972	Nutrition—A review of the WHO Programme 1965-71, Geneva.

NUTRITION EDUCATION IN U.S.A.

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The improvement of nutritional status of the population to enrich the quality of life was accepted as a challenge by the American Nation. In 1941, when America was rapidly expanding their defence programme, it was found that majority of youngmen were unfit for military service. It was obviously due to nutritional inadequacy. Bureau of Home Economics (now called the Bureau of Human Nutrition and Home Economics) of United States Department of Agriculture through their studies in dietary habits found out that three-fourths of people had poor dietary intake. This was true for people in general as well as for school population. The Milk Bank Memorial Fund corroborated the above findings by their studies among the high school pupils indicating the low dietary intake among them. The raising of the health standard of people by adequate nutrition was a prime concern before the nation.

The high standard of health enjoyed by American people in general today is the result of a prolonged and serious effort through several action programmes in nutrition and a well organized programme of nutrition education. Nutrition Education programme in the country has taken a well-defined shape based on a realistic situation. At the school level, nutrition education is considered to be an integral part of Health Education. The subjects of nutrition is taught under Health and Physical Education in the school curriculum. It has also found an important place in the study of Home Economics and Biology. Nutrition Education is not only carried out through well defined curriculum of the subject as an integral part of the various subject areas as mentioned above but also through a well organized programme of school health service. The teachers are properly oriented to play an important role in this regard. They act as a useful link between the doctors and nurses on one side and the students on the other. Cases of nutritional inadequacy and malnutrition are identified by the doctors for proper correction. Parents are also involved in the programme. The teachers are well equipped to spot-out the obvious cases of nutritional deficiency during their day to day observation of pupils. The cases are referred later on to the appropriate. Medical authorities for necessary treatment. School lunch programme provides a good opportunity for imparting nutrition education to pupils.

The curriculum on nutrition education is graded for different levels to suit the pupils. Adequate instructional materials of the right type like text books, Teachers' Guide, etc., are available to the teachers who can make proper use of them. Teaching Aids like film strips, films, etc., prepared by different organization are made available to the teaching community. A great attention is paid to research and evaluation of the instructional materials which provide feedback to the programme of nutrition education in schools.

Teachers Training Colleges in Universities have a Department of Physical Education, Health Education and Recreation for training of teachers. Courses in nutrition are offered by different schools of Public Health. The National Education Association of America and the American Medical Association have joined hands in the important task of imparting nutrition education as an integral part of health education in schools through a series of publications.

The nutrition education programmes in schools are strengthened by programmes of nutrition education carried out in the community by country and local Health Departments along with other health activities. Full use of modern mass media and audio-visual techniques is made to reach the different sectors of population.

Several action programmes in nutrition have made the nutrition education programme a more effective and meaningful one in the promotion of the health status of the population. Improved methods of storage and preservation of food and the improvement of nutritive value of food through enrichment and fortification have ensured more diet and diet with nutritive value to the American population. Indeed, modern food technology and food processing is playing a significant role in promoting nutrition of the people.

Application of modern technology in the field of agriculture has made the nation a surplus one so far as some of the basic articles of food are concerned. Continuous modernization of agriculture has ensured the basic food supplies to the nation on sustained basis. Different agricultural extension activities are carried out for bringing the technical know how relating to agriculture to the farming community. Various activities are carried out under agricultural research such as plant breeding, pest control, water management and use, soil fertility, etc. There has been a considerable improvement in pig and poultry products, fishery resources and dairy products in the country.

EXPLORING POSSIBILITIES IN NUTRITION EDUCATION

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Nutrition Education seeks to create an awareness of what we eat and its relation to our health. It does more. Gandhiji used to call education an instrument rather than an end in itself. Nutrition education is an instrument to achieve better dietary practices through better use of food resources.

The Protein Foods and Nutrition Development Association of India has been concerned with nutrition education in many ways. I shall discuss some of the possibilities of nutrition education in the light of the experience of the Association.

The makers of the Association knew that we are a poor country. A majority of our people do not have enough to eat. And that widespread malnutrition affects the economy of the country.

It was a general awareness of the nutrition situation. The association was also aware that basic bio-researches on nutrition had made tremendous advances. But these needed to be applied to solve some of our food and health problems. Other had to be made aware of the findings on the laboratory benches.

Diet Survey

On the other hand, to design action programmes, specific information was needed on food habits of people, their tastes and preferences, income, education, social background and attitudes. So the Association started with a comprehensive food habits survey in Maharashtra and Gujarat in 1969. These data revealed the nature and extent of some of the problems of malnutrition in the area. The next step was to decide what the Association could do about them.

Mass Communication

Of the many things the Association thought of, one was the possibility of nutrition education through mass communication. Could techniques of mass communication be used for nutrition education?

Any communicator faces the problems of waste to communicate, to whom and how. Much of what to communicate and how depends on the decision of *Whom* to communicate to. The decision in this case was made easier by the food habits survey data. We chose a target of people from lower-middle and middle income groups of school teachers, small clerks or industrial labourers. Analysis of their situation showed that ignorance rather than poverty was the chief cause of their malnutrition. They also had a potentially surplus income for use in bettering their nutritional situation if they could be motivated to do so. They were also economically productive.

Children were nutritionally the most vulnerable section. Children also have a great emotional-motivational pull. So the creative strategy of the campaign was woven around children.

We used press, cinema, hoardings and posters supplemented by a public relations campaign.

To evaluate the effectiveness of the campaign we designed a research programme to judge and measure the hierarchy of effects generated by the campaign; a bench-mark survey before the campaign to establish the level of awareness and knowledge a mid-term evaluation to manitor the effects of the campaign and post-campaigning survey to assess the results.

The campaign resulted in a deeper and wider understanding of the nutritional knowledge we wanted to impart, knowledge on weaning concept had gone up considerably, some 20 to 30 per cent of the targets were sufficiently moved to change their diets.

The cost per effective contact was 28 paise.

The pilot campaign proved the hypothesis with which we had started—that mass media based education can be cheap, persuasive, uniform, repetitive, and effective and, therefore, has immense possibilities. We came to know of the shortcomings of such a campaign, which is equally important.

Consumer Study

We tried to examine the possibility of another way of education using the concept of social marketing. Social marketing is an extension of the concept of the marketing mix of the systems approach to marketing the non-traditional fields such as the one we will consider.

Our food habits survey in Gujarat and Maharashtra had revealed that people normally refuse to buy atta from the market. They would rather buy whole wheat and take it to the local Chukkies for milling. The reason was fear of adulteration of the atta available in the market.

At the same time we knew that atta could be easily fortified with extra nutrients to give people extra nutrition at a very low cost.

The Association, therefore, wanted to test the hypothesis that the consumers' fear of this kind of adulteration could be overcome by producing a good product, by packing it hygienically and attractively and incidentally, by fortifying it with extra nutrients. The hypothesis, if proved correct, could open a new vista for nutritional fortification through a medium that was already widely acceptable irrespective of income levels and other considerations.

We designed a market testing operation which incorporated all the elements of a total marketing concept. We made the product, attractively packed it and took the required steps for adequate promotion and sold the product at the same price as that of whole wheat through the ration shops. We followed it up with a consumer survey to find out the attitude of housewives towards the fortified packaged atta as compared to wheat and other wheat products.

As a pointer to a possible marketing venture the results of the test marketing were not conclusive, though later opinion of consumers on possible use of packaged fortified atta was highly positive. Major considerations for using such atta were taste and quality, followed by economy. Fortification was not an important consideration. Doubts about an unfamilar product was a major negative factor.

The experiment didn't support our starting hypothesis fully. However, we learned that you cannot, perhaps, sell or popularise nutrition as such unless you bear in mind consumer-satisfaction with the product and try to overcome their fears and inhibitions by suitable education.

School Education

We tried to do our little in the field of institutional education though our scope was limited. For example, we surveyed the school syllabus on food and nutrition in various States. We made a study of the text books dealing with these subjects. We even rewrote some of the chapters, we hoped we had made some improvements, and submitted them for use by the various state education authorities. We did not ask for many credit and we offered our facilities to be used for the quaries. Acceptors were not many but the response has not been too discouraging either.

In the matter of nutrition education in schools or say in home science colleges, we feel that it is time for making up our mind about some of the basic concepts we want to convey in respect of both their content and intent. This will make it easier to prepare and deliver a packaged programme.

As to content the following two subjects are a must for everybody at all levels.

They are:

(i) Foods and nutrition.

(ii) Health and hygiene.

We would add a third: Motherhood and family planning. A brief outline of what these subjects may include is attached. Of course, we have to try for a relative balance of content depending on the intent. Intent will differ according to situation and circumstances of the recipient.

There will be problems in trying to decide on content and intent. Let me try a few examples. We may decide to extoll the virtues of milk. A school text for children after doing exactly that says something like "now you know why you like what some stupid children do." This will be good for children who have the choice to make such a fuss about precious milk. Not many of our children have that choice. We teach the rhyme "An apple a day keeps your doctor a way." In the context of our country could it be better to emphasise on other fruits, that are cheaper, but much more nutritious? How do we emphasise? Apple or grapes have *status*—How do we give such a status to other fruits? We must seek answers to these, because nutrition is not eating what you cannot afford.

Take another aspect. Are the text books or other reading materials we use as educational aids simple enough in language or could they be made more attractive? Professional communicators use objective basis to judge the simplicity and attraction of the language they use; the readability, as they call it. They can tell you whether the 'copy' can be read and understood by students of a particular grade. Can we apply similar objective basis for writing school textbooks or education in general?

Feeding Programmes

Next, I would comment on the educational possibilities in the context of the various government sponsored programmes like the feeding programme of the health and family planning programme. Take the feeding programme. The simplified chart gives an idea of who educates whom under what programme.

Educator	*Audience*	*Feeding Programme*
Balasevika	Mothers of pre-school children	Balwadis pre-school feeding programme
Supervisor	Mothers (illiterate)	Special Nutrition programme
School teacher	Young school children	School-feeding programme
Gram Sewak/ Sevikas	Mothers (literate or illiterate)	Applied Nutrition programme

Here is a challenge and an opportunity to do a lot in many ways. It is a programme with a captive audience who can be exposed to a whole new life style within a period of time. Take the child of poverty who gets free education devised by experts. He may not only be exposed to text books but to colourful picture cards, or even to audio-visual materials mediums and sets of instructions thoroughly researched, developed and pre-tested for guaranteed success all for him.

The child also gets a wholesome meal made adequately tasty and nutritious for him by pople who know and care. The food is hygienic. Perhaps, we sees how hygenically the food is cooked or packed for him. He is taught how to eat it, not with dirty hands. He knows he must drink only clean water.

And he carries his knowledge home.

I am not trying to make it sound too rosy or say that it can be done easily. It is a possibility.

Teacher Education

I have not forgotten the teacher, the key person in school education where it is mainly person to person communication. Or that the teachers may not have any of the aids, like text-books, I mentioned barring a blackboard. This leads to the importance of teacher education. The principles or the philosophy behind a methodology of success applicable to any communication programme applies to teacher training and education also.

Proposal

We suggest that all efforts be directed initially to devising, developing and testing educational materials and the systems for their delivery before we launch a new programme, be it a teacher and taught programme or a mass communication programme. Otherwise, however well meaning it may be, much of unproven and ill-tested ideas lead to waste or may even have negative effects.

SCIENCE AT THE PRIMARY SCHOOL AND NUTRITION EDUCATION

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The unique feature of the primary science programme is reflected in the title of the materials, i.e., 'Science is Doing'. Thus activity-learning has been given maximum weightage. It is now proved beyond doubt that the children learn best when they themselves are involved in the learning process. Primary science programme is a structured programme and contains a regular course content. Both the product as well as process of science have been emphasised. Product, i.e., the science content has been called from the immediate environment of the child—physical, material and biological. The programme envisages to develop the nine basic process skills listed below:

Observation—Observation skill may be developed through all the basic senses—touch, smell, sight, taste, hearing.

Classification—Based on observation classification skill may be developed. Only one or two criteria based classification is emphasised. For example, colour, shape or size. As their skill develop they will learn to classify using 3, 4, 5 or more factors.

Communication—Knowledge gained on the basis of observation need to be communicated. This may be either through (a) verbal communication, (b) written communication, (c) pictorial communication. Thus exact recording of observation is a basic scientific skill.

Measurement—Children learn to compare sizes of objects at an early stage. Quantification of such observation in terms of length, area, volume, weight, temperature may be developed further.

Using number—Manipulating number is yet another process skill. Through concrete experience abstract manupulation of number can be developed.

Experimentation—All the skills mentioned above are tools for experimental investigation. Designing simple experiment using only one variable has been used in the material.

Analysis and comparison of data—Data obtained from experiment need to be carefully analysed. Data obtained from simple experimental observation can be compared and analysed before a conclusion is reached. This will also develop ability for critical thinking.

Prediction—Ability to predict what will happen in other situation based on the data obtained is very important. Simple prediction based on experience may be made at this stage. For example, what will happen if you throw a ball in the air?

Time distance space relationship—Perception of space vary as a child grows. If an effort is made to develop these relationship it would help in developing intellectual ability of a child.

All these process may be used to develop concepts in nutrition education.

In the NCERT published text book, ('Science is Doing' first the problems are posed and then through "Let us find out", it is explored. There are ten units in the text book which cover little of physical, biological and earth related sciences.

NCERT has followed an extensive training programme towards the implementation of the primary science programme. A chain of training programmes starting with the training of Key Personnel from the States by NCERT, down to the training of primary teachers of different states. In all these training programmes philosophy, content and methodology are emphasised. The trainees also learn the use of the kits which is very important for practising activity learning. The activity suggested in the course are mostly group activity which will develop in the children leadership, cooperation and such desirable social habits.

In the context of nutrition education it may be said that the primary science programme which is our already on going programme in most states can be very important channel for implementing a realistic, well planned nutrition education programme.

Elementary concepts of nutrition are already present in primary science programme particularly in the unit on 'Human body, Health and Hygiene'. Elementary idea about various foodstuffs (arbohydrate, fats, protein, vitamins and minerals) their use, proper method of cooking, proper eating and food habits are included in this unit. It is necessary to emphasise what to eat, why to eat, and how to eat, A realistic nutrition education can only be possible if we give due importance to the environment of the child. While including the components of nutrition education it should be borne in the mind that training that a child receives in the school is well practised at home. Duality of environment at school and at home has been the major stumbling block in bringing about the desired attitudinal changes. There is no point in telling a child that he or she should have a balance diet when all that he or she gets is perhaps a chapati and protato. The habits which we want the children to imbibe should take into accounts, the availability and cost of the food; and socio-economic and cultural background of the children.

APPRAISAL OF NUTRITION EDUCATION PROGRAMME IN INDIA

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Compared to the vast size and population of our country, the impact of nutrition education on our people is insignificant.

Our Institute is associated with the training of public health workers, coming from different parts of India: many of them are attached to the primary health centres and M.C.H. Centres in rural areas. From their experience, it can be said that a large number of nutritional disorders are mainly due to ignorance. One example is nutritional blindness. There are about 5 million blind people in India and of these about 25% or 1.3 million are of nutritional origin. In a survey, our students have found a whole family suffering from night-blindness and xerosis; they have found the remedy also in the same house—plenty of green leafy vegetables—grown, but not consumed; the vegetables are kept for selling mostly in the urban area. When questioned, it was found that the family members considered night blindness as a hereditary disease caused by curse of God.

Nutrition education is at the elementary stage. So methods of appraisal would actually have to be formulated after some practice of nutrition education on different target groups. It should depend on the nature of the target group and so also on the type of nutrition education itself. For example—the target group may be (1) School teachers, (2) School students, (3) Housewives with infants from the rural area, (4) Common people like village leaders and social welfare workers, (5) Specialists like doctors in Public Health Service and other Health Workers. Each target group will have to be imparted different pattern of nutrition education.

All nutrition education programmes must cover the problems, needs and interests of the individual group and at a peripheral level-of the individual families. These problems, needs and interests must be adequately indentified first.

If the target group be the rural house wives with infants and toddlers participating in a "nutrition demonstration programme", evaluation should be made on various critaria—primarily their interest in the programme—did they really like it? Was the demonstration suitably adapted to their conditions of living? Can the audience practise it at home? Eventually the mothers should be followed up in their homes to see if they used the recipe at home subsequently and if not, why not? Are they too expensive, too complicated, too unfamiliar or too tedious to prepare? Are these still considered unsuitable for infants? Are the mothers still thinking that th infants do not need anything beyond breast milk until they are twelve months old? Have the mothers noted diarrhoea or allergies, etc. which can be attributed to this food?

It is our experience that all nutrition education programmes should be individually formulated after tactful appraisal of the existing knowledge of nutrition amongst the target group, whatever rudimentary it may be. Careful questioning like—what makes the barley grow? Why do we eat different foods? Function of different foods in the body—relation between food and some very common nutritional manifestations like angular stomatitis or glossitis makes the common groups very conscious about the subject and prepare them as very good target for nutrition education. We have found this preliminary appraisal to be very helpful in all nutrition education programmes.

Sometimes in the beginning, school teachers and health workers consider this nutrition education programme as an additional burden. Our approach under these circumstances should not be to present the subject as a "Professional training programme" but to discuss with them about a matter which concern their own health and particularly the health of their own children. When they hear about the great influence of nutrition on growth and function of brain and that fault may permanently hamper the development of mental functions of their children, they completely change their attitude to the subject of nutrition and actively cooperate with the programme.

Nutrition education should not be imparted in an empirical manner. This never lasts long and rarely put into correct practice.

If we say—"You must take plenty of green leafy vegetables whn you are expecting a baby, othrwise your baby will be sickly", they may put this into practice for a few days. Our students have found out that after such a flash training, the housewives boil the green leafy vegetable in plenty of water, then completely throw away the cooking water and fry the residue well in an open pan.

Whatever may be the standard of the target groups, basic relations between food and growth, development, learning, physical efficiency, freedom from infection and maintenance of health, should be explained to them in their own standard as simply as possible. WHO also considers that this is very important to ensure that the nutrition education programme will not merely be a flash-in-the-pan but an on going programme with proper sequence and development and periodic evaluation.

Moreover the flash training has also a great risk. This same technique may be utilized to push proprietary foods of doubtful nutritive value. We can take the example of lysine. Lysine is deficient in cereals, particularly, in wheat. Many proprietary foods and Ionics with lysine were put in the market with tall claims; sometimes practising physicians also prescribed them with resultant drainage of money from the poor patients. But it was observed at our Institute in a collaborative study on the lysine-fortification programme, sponsored by the I.C.M.R., that no significant beneficial effect on growth, development and general health could be observed when common diets containing wheat and pulses were fortified with lysine.

PRESENT POSITION AND FUTURE PROFILE OF NUTRITION EDUCATION IN THE SCHOOL

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Introduction

Health surveys carried out in India show that a considerable proportion of school children is malnourished.[1] Much of this malnutrition could be reduced if parents, teachers and children understood better what a balanced diet is and how best to use the family income in the choice of foods.

Many of our eating habits are developed in childhood. The elementary school years are, therefore, one of the best period for establishing the most desirable food habits. In this respect, the school has a major responsibility to teach the child about maintaining his health and growth through the food he eats. The aim of nutrition education of the children, therefore, consists in making the children know the basic facts of foods and nutrition and in promoting a desirable change in their food habits. The children should be educated to consume voluntarily and with pleasure the right foods in the right amounts. Several studies on the content and methods of nutrition education in schools have been conducted in other countries.[2] Except for isolated studies on the need for nutrition education in the improvement of social behaviour in children, through school lunch programmes,[3] and health education,[4] there appears to be no systematic study on the content and methods of nutrition education in schools.

Content of Nutrition Education in Schools

In ensuring adequate nutrition education in schools, the following aspects have to be considered:—

(a) The syllabi
(b) The Text books
(c) The teachers who handle the subject.

(a) THE SYLLABI

Syllabi should be adequate and appropriate to the age and mental development of the children. Our Institute made a special study of the syllabus currently in vogue in Andhra Pradesh with a view to see if the introduction of the various concepts in the different grades is gradual and in right sequence. The subject of nutrition in the elementary grades is covered under the broad heading "Elementary science (including school gardening)" and "Health and Hygiene". Hence the syllabi in elementary science and hygiene for the classes I to VII were examined. Based on the topics in nutrition contained in the syllabus in sciense recommended by the NCERT, New Delhi and the Central Health Education Bureau, the whole subject matter on nutrition to be covered at the elementary school level can be broadly summarized in the following concepts[5]:—

(1) Recognition and familiarity with different types of food stuffs early in childhood leads to an understanding of their value and importance in daily life later.

(2) Food hygiene is essential for good health.

(3) A proper diet must be based on a diversity of foodstuffs because food has various functions to perform and different foods help to perform these functions.

(4) Vegetables, fruits, milk and egg are important for growth and health.

(5) School gardens and kitchen gardens can be usefully utilized for growing vegetables and fruits.

(6) Food consists of several nutrients and these nutrients cater to different needs of the body.

(7) Food requirements vary in different physiological groups.

(8) Proper cooking is necessary to make the food more easily digested and assimilated by the body.

When this Institute made a detailed study of the Andhra Pradesh syllabus, it was found that the first and third class syllabi did not contain any lesson on nutrition. The topic "Food hygiene" was dealt with in Class II. During the primary school stages the child's learning is mostly related to understanding the meaning of the objects in his immediate environment. Children need guidance from teachers to observe the objects around them. They can be taught, at this stage, to identify foods and associate them with their colour, shape, appearance and taste.

The A.P. syllabus has been so framed that in class IV, children learn about the different kinds of food and associate good food with good health, In Class V, they learn that foods should be wholesome and nutritious and how cooking is beneficial. In Class VI, the above concepts are developed in detail and children learn about the nutrients, their functions and the value of mixed and balanced diets. In Class VII no topic on nutrition is included. While the overall approach is sound, some re-adjustments in the sequence of development of the topics would appear to be necessary. It is a basic principle in teaching to lead from known to unknown. From this stand-point, the syllabus of Class VI which reads like this, "Composition of food—CHO, proteins, fats salts and minerals, water, vitamins—food for energy, for building and reprairing the body, for strengthening and smooth health functioning, mixed diet, balanced diet—food values of common food articles," can be advantageously changed as "Functions of food-values—association of these with various nutrients and their functions meaning of mixed and balanced diets."

In comparison with the general service syllabus recommended by the National Council of Educational Research and Training, and the Health Education Bureau for various age groups, a few of the basic concepts were found to be omitted in the A.P. Syllabus. For example the sub-concepts (1) "Quantity of energy-giving and body-building materials; normal workers require more energy-giving food and so on, (2) Care should be taken not to get nutrients lost tn cooking; cooking destroys certain vitamins; over cooking should be avoided; and no more water than necessary should be used in cooking" were found to be omitted.

(b) THE TEXT-BOOKS

In order to evaluate and interpret the contents of a syllabus, it is necessary to consider the lessons in the text books prepared on the basis of this syllabus, simultaneously, as, text-book writers interpret the same headings in different ways. For example, "Healthy food was interpreted by one author to mean all the nutrients in food while another interpreted it as covering only the "Vitamins in Food," in A.P. Lessons on nutrition in nine text-books in use in the English medium schools in Hyderabad were scanned. These included the nationalized text books published by A.P. Government for Classes IV, V and VI as well as those published by missionary schools and others. It was rather painful to observe in these text-books certain statements like. "Vitamins are living germs", a balanced diet contains equal amount of proteins, flats and CHO", the seven basic cereals are rice, wheat, jowar, maize, ragi, bajra and millets." "These cereals contain mostly substances called vitamins" "Dal like cereals furnish energy" "Root vegetables like potatoes, radish and tapioca are rich in proteins"; "Cooking increases proteins" ,"Other cereals too are nutritious such as millets, wheat, dal and gram", "milk is a source of vitamin C", and "a balanced diet for an adult contains 400 g. of CHO, 100g. of proteins and 1 g. of fat".

Some passages dealing with the functions and properties of nutrients were much beyond the level of comprehension expected of children in these grades. For example a VIth grade science text-book contains the following statements—"Proteins are nitrogenous compounds which are helpful in building up muscles and tissues", "the animal proteins are 'casein' from milk, 'albumin' from egg and 'myosin' from meat"; the vegetable proteins are 'gluten' from the flours of wheat and 'legumin' from peas and dals," and "the proteins are changed to 'peptones' and amin-acids by the action of digestive juice." Such biochemical facts are best dealt with in high school or at the graduate level. These high sounding words mean nothing to a child without the necessary background knowledge of human physiology. Moreover, several of these words have been mis-spelt, e.g., "glutein for gluten, legomen for legumin, albomen for albumin, etc. This only serves to emphasize that in addition to teacher and students, 'writers of textbooks should also be given source material' so that the correct terms are presented in the right sequence and in as simple a manner as possible, for the children to appreciate and understand what they read.

However, the nationalize, text-books in Telugu published by the A.P. Government cover almost all the aspects of the syllabus except for a few omissions like "the protective function of food" in Class VI and "need for water and its function" in Class V.

(c) THE TEACHERS

In addition to an adequate syllabus and good text-books, possession of sound knowledge by the tetcher has a positive impact on the children. All three components are inter-dependent and for a successful nutrition education programme, each component should be as perfect as possible. A teacher's handling of nutrition education can be evaluated in the following ways :

(a) Her knowledge :

(i) How much does she know?

(ii) What is her background?

(b) Motivating devices used by her to make the children learn:

(i) What methods does she use to teach?

(ii) How much time does she spend on nutrition.

(c) Impact of her teaching on the children:

(i) What is the effect she has on the children?

(a) In order to find out the knowledge of the teachers, teaching science in elementary schools, this Institute admintstered a carefully prepared questionnaire covering their educational background, experience, and attitude towards teaching science among 47 teachers in 22 schools in Hyderabad^{6}, 12 out of the 47 teachers possessed knowledge above average and the English medium schools contained a higher percentage of these teachers.

When their opinions were sought on the purpose of growing vegetables in the gardens, they were asked to rank the following 4 statements in the order of importance.

1. To demonstrate germination and growth of plants
2. To teach gardening
3. To teach the value of vegetables
4. To grow more vegetables

"Teaching gardening" came first and "demonstrating germination and growth" came second. The value of vegetable and growing more vegetables were ranked as being the 'least important' purposes of a school vegetable garden.

Thts undue emphasis of "teaching gardening percentage" can be attributed to the syllabus and the text-books. The syllabus and the text-books including the nationalized text-books of A.P. do not make any specific mention of the use of vegetables except for a sentence in passing. Some information, therefore, needs to be included (in both the syllabus and lessons) on the value of vegetables especially green leafy vegetables.

It was also interesting to note that the percentage of trained teachers was highest in the English medium and government schools (89% and 91% respectively) and the lowest in the aided schools (21%). Employing untrained teachers will naturally affect the quality of teaching.

It was also observed that there was a rapid turnover of teachers in aided schools unlike the other schools and these teachers were entrusted with the teaching of science and soon after joining service unlike the English medium or Government schools. These two facts may tell on the quality of teaching in aided schools; 50-55% of the teachers either gave less information than what was in the text-book or just read the lesson. Many of the teachers in aided schools were not even familiar with the information contained in the tex-book neither did they make any attempt to correct wrong statements (mentioned earlier) nor did they use visual aids. Children's participation which is important, was almost totally absent in all the schools.

Out of a total of 4 weeks devoted to the topic of nutrition every year, consisting of about 60-180 minutes per week for class IV and V and 120-135 minutes per week for Class VI, only 20-32 minutes were actually utilised (on an average) and it was not known how the rest of the time was utilized. This "apathy" to teaching nutrition may be due to either the lack of knowledge or other topics were considered more important. This only emphasizes the fact that teachers be made to realize the importance of and be equipped to give accruate and adequate information to the children.

Future profile of nutrition education

Thus the role of the teacher is an important one in making children nutrition conscious:

(1) Through theory and practical lessons in nutrition in the classroom.

(2) By taking an active interest in all the national programmes intended for school children.

If teachers of primary schools are to inculcate proper dietary habits in children during the inpressionable years of their development, they should receive adequate training in nutrition. The text-books for children should contain relevant and accurate information on all aspects of nutrition. There is need for repetition in the formative years and lessons in nutrition in every class should be preceded by a brief review of the subject in the previous class.

Nutrition education should not remain an isolated subject in the school curriculum but should become "One of the threads of the fabric of the curriculum." In our primary schools, quite often the class teachers teaches science besides other subjects. Thus he gets ample opportunities to integrate nutrition with other subjects such as social studies, physical education, language, fine arts, arithmatic and so on. Some of these concepts can be summarized as follows:

1. **Reading** : This forms an important part of teaching in the earlier years of schooling for children, e.g., names of fruits and vegetables, etc.
2. **Writing**: "Food habits of different peoples of the world"—compositions and essays.
3. **Language** : Creating original write-ups on different topics in nutrition in the local language.
4. **Arithmetic**: Sums to compare nutrient content of different fruits or percentage dilution of milk and availability of protein, etc.
5. **Social studies** : Comparison of physique and appearance of different peoples of the world and correlating it with the foods eaten.
6. **Physical instruction**: The need for good food to be well nourished and comparing growth patterns.
7. **Fine arts**: Making drawings or clay models of fruits and vegetables, giving them realistic colours.

Thus the more resourceful a teacher is, the more meaningful and purposeful will be his or her teaching of nutrition [7,8]

Visual aids are very important for every nutrition lesson. These aids can be of many types such as flash cards, picture cards, flip-charts, wall posters, models and if facilities are available, microslides and films. The preparations of these aids can form part of the students assignments [9,10,11,12]

In addition to class-room teaching and home-work the teacher should devise some practical lessons common to the whole class, to keep up their interest in nutrition. The most popular one is an animal experiment. If time, space and finances permit, this should be included in the science syllabus of a school. White mice, guinea pigs and rabbits are some of the experimental animals that can be handled by children easily. There is nothing so stimulating as animal experiment.

Role-playing[8] can be effectively used to motivate children to accept new foods and remove prejudices against certain foods commonly eaten at home, like e.g., milk and green leafy vegetables.

Group songs in the diffrnt Indian languages are very effective tools in conveying the importance of foods and nutrients to children—e.g., "Villupattu" in Tamil Nadu[8].

Conclusions

Thus we can summarize our findings as follows:—

1. The role of nutrition education in a school curriculum is an important and crucial one.
2. There is need for repetition of the different concepts in the formative years to ensure retention of the knowledge gained.
3. There is need for illustrated, well documented and accurate information in text-books.
4. Visual aids of all types should be used.
5. Lesson in nutrition should be introduced from class I upwards, e.g., learning by observation and association of actual foods with the health of different parts of the body in the first two grades followed by functions of different food groups and their specific uses, technical terms used in nutrition deficiency diseases, etc., in the higher classes up to class VI.
6. Personal cleanliness as well as cleanliness of the surrounding and the kitchen and hygienic preparation of food, of course must go hand in hand with lessons in nutrition.

References

1. Gopalan, C. and Someswara Rao, K. (1961)—"Clinical Nutrition Surveys" Special Report Series 36, ICMR, pp. 3-25.
2. Whitehead, F.E. (1957)—Journ. Ame. Dietet., Assoc., 33 : pp. 880-885.
3. Rajammal Devdas et al. (1964)—J. Nutri. Diete., Vol. 1.
4. Dwivedi, K.N. et al. (1973)—Int. J. Health Educ., Vol. XVI, pp. 100-106.

5. Champakam, S. and Balasubramaniam, S.O. (1966)—J. Nutri. Diet., Vol. 4.

6. Ibid (1967)—J. Nutri, Dietet., Vol. 4.

7. Ibid (1967)—J. Nutri. Dietet., Vol. 4.

8. Lessons in Nutrition (1973)—National Institute of Nutrition, Hyderabad-50007, pp. 56.

9. S.L. Ahluwalia—Preparing graphic aids, National Institute of Audio-visual Education, NCERT.

10. S.L. Ahluwalia—Simple visual aids for social education Nat. Inst. Audio-visual Edu., NCERT.

11. S.L. Ahluwalia—Audia-visual Handbook, Dept. of Field Services, NCERT.

12. H.S. Bhola—(C.I. Education) Effective use of display material in schools, NCERT.

13. Rajammal Devadas—Personal Communication.

NUTRITION EDUCATION IN SCHOOL : PRESENT POSITION AND FUTURE PROFILE

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I am not a specialist in nutrition. So I shall be unable to give an authentic details of what to eat and what not in this world-wide food shortage period. As a common man thinking in this line I can only say that proper nutritional education will not be appreciated in this country unless education in nutrition should be considered as a problem for mass education and it is treated as a compulsory subject from the very beginning.

As regards nutrition education it must be admitted that our State is backward if not our country as a whole. Therefore, I like to discuss the position of nutrition education of our State at the school level which in my opinion should be a must in order to produce a large number of nutrition specialists to cater the need for the country.

At present the problem of nutrition is not considered at the school level. Previously, however, a little knowledge of food and nutrition for the school going children was a must in the curriculum of hygiene but with the introduction of higher secondary streams very little attempt has been boosted for its re-introduction. In the latest curriculum for the Class X course introduced from 1974 a scrutiny exposes that though a little amount of nutrition education is touched, it is, however, very significant. The secondary education starting from class IV to class X has the curricula for life science at all phases. But it is curious that in the prescribed 80 pages for class VII only 6 pages have been reserved for dealing with food, while in the curricula for classes VI, VIII and X not a single page is allowed for dealing the topics on food and nutrition. In this respect a student of class IX is, however, getting 28 pages out of 128 pages to learn something about nutrition, metabolism, digestion, food, vitamins, enzymes minerals and water. Thus out of a total of 440 pages in the course of life science at the secondary education phase reservation of only 34 pages after food and nutrition seems to be inadequate specially when proper education in nutrition and health is considered essential everywhere.

In my opinion our future profile of education at the secondary school level food and nutrition should be considered as a separate subject and if not due to certain reasons like over burdening of the course, the syllabus of life science at every phase should be thoroughly modified and revised. It should be a nutrition rather than metabolism-oriented subject with touches of gross morphology, anatomy, systematics and ecology incorporated in the same.

NUTRITION EDUCATION IN SCHOOL CURRICULUM

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Widespread undernutrition and malnutrition in the larger segment of our population, especially the vulnerable segment is causing considerable damage to our economy by way of reduced output or outturn of work, i.e., lower production. Both the Central and State Governments are well aware of the problem and trying their best to fight out the enemy within the country. International agencies like CARE, FAO, etc., are also assisting in the programmes. In our country the problem is much more complicated, as nearly 80 per cent of our population live in rural areas and the percentage of literacy is 29.4 in 1971, one of the lowest in the world. The all-India percentage of literacy is again unevenly distributed. Another important factor, which requires the greatest attention is the fact that 42 per cent of our population is below the age of 15 years, which has not yet received the due attention. But this again is a boon if it is properly exploited.

As per statistics available in 1971-72, total food produced in India could provide only 2100 calories per capita per day as against the needs of 2357 calories per head per day. But a large majority of people live below the poverty line and under subhuman conditions; most probably they are getting only barely sufficient and slightly above the basal requirements. In spite of rapid increase in production of food grains, there is very little or no increase is found in the availability due to rapid increase in population. The birth rate having remained more or less constant around 3.9 per cent annually, the death rate had fallen considerably due to the various steps taken up by Government from 2.7 per cent in 1951 to 1.6 per cent in 1966. While about 21 million are born every year at the rate of a baby every 1½ seconds, only 8 million deaths occur every year making a net addition of 18 million heads. This increase per year is more than the total population of the continent Australia. The additional resources required annually are 2,509,000 houses; 188,774,000 metres cloth; 12,545,300 quintals of food.

The widespread undernutrition and malnutrition can be solved by mutiprolonged attack by way of increased production, reduced population growth improving the public distribution system, better methods of storage, conservation system, and effective utilization of available food resources and nutrition education. Nutrition education should be imparted at the very tender age of the person, as the person will be in a better state to receive and formulate. Dietary habits are difficult to change in adult stage unless compelled to do so. The most common deficiencies found in India are Protein-calorie Malnutrition, vitamins and mineral deficiencies like calcium, Iron and certain nutrition disorders like Goitre, Lathyrism, Fluorosis, etc. Through Government of India in collaboration with National and International agencies has started various programmes like special nutrition programme, mid-day meal programme in schools, composite nutrition programme, applied nutrition programme and family and child welfare programmes. But nutrition education in school has not received the due attention.

The age old, well known saying, that what cannot be bent in plant stage can never be bent when grows to the stature of a tree. For effective modification of the outlook of the future citizens in India, it is very much essential that the present day school children are properly educated at the evry young formative stage to implant the principles of nutrition for effective results. The curriculum may start from Class VII making a reference to the principles of food and nutrition and by the time the child reaches Class X, the final year for school leaving examination, the child should be made clear about the science of nutrition without ambiguity. A paper of 100 marks on the principles of nutrition in Class X for all students irrespective whether they belong to science group or arts group should be introduced with effect from the final examination commence from 1977 or 1978. Also the marks should be taken into consideration, while calculating the order of merit of the student or class or division.

It is felt that, besides the principles of nutrition, the science of cookery and dietatics should also be in the curriculum and to impress upon the young minds on these various aspects, practical demonstration is also very essential for which syllabus should also be there.

The lessons introduced into the text-books should be written in such a way that the principle behind should make a permanent impression in the young mind, while making the young child educated and more informed. The figures quoted should be so connected with description so that it would create an imprint which could not be wiped out. If necessary, horrifying and terrifying sentiments may be introduced to make the strongest impression on the yound mind.

The colossal losses of food items during storage, transport and in retail market, the modern methods of storage, packing, transport and hygienic way of handling foods and prepared foods should be invariably included in the curriculum in the form of stories and good photographs.

In a developing country like ours, with the population explosion continuing unabated, undernutrition is the root cause of malnutrition and the only way of fighting the undernutrition is the multipronged attack on limiting population increase, planned parenthood, reduction of wastage, diversification of food habits and improved communication and distribution systems.

According to every modest calculation, the requirements of milk are increasing by 25,000 litres a day and India, in spite of its cattle wealth, is one of the lowest milk producing countries in the World. Out of this, a large quantity of milk is diverted to preparation of casein and its associated sweets resulting in colossal waste of nearly 30 to 40 per cent of the best unique nutrients of milk. The loss of these nutrients should be impressed upon the young brain. Another field of colossal waste is the habit of taking green coconut water for quenching thirst. The loss in this item and the resultant public health hazard need not be stressed once again here.

Undernutrition cannot be fought without increasing production and increasing the production in the agricultural land may be just touched upon but increasing production of kitchen gardens and school gardens should be impressed upto the young child. The whole chapters may have to be rewritten with emphasis on impression than on principle and conservation of space and cost. The chapters should be fully illustrated with cartoons and real photographs and drawings.

A few paragraphs on the economic aspects of undernutrition and malnutrition and its relation or effect on the individual, family and the nation at large should be introduced at various appropriate places to create the maximum impression at the proper time. In fact the whole curriculum will have to be throughly overhauled. If any of the best articles on nutrition are found in any of the Indian languages, it should be freely translated into all other Indian languages for the benefit of the young.

It is perhaps desirable, to formulate the detailed syllabus for the schools, an All India Committee may be constituted, incorporating members, eminent in the field of science and technology dealing with the branchs of food, nutrition, agriculture, medical, etc. It is further felt that perhaps formulation of detailed syllabus may not be very helpful unless an infrastructure is build up to train the teacher who will be mainly responsible for the effective implementation of the Nutrition education programmes in the country. At present there are large number of Gram Sevak Training Centres, Extension Training Centres and like type of training centres are located in several districts in almost all the States in India. Assistances of such centres and other institutes, etc., may be availed of to arrange intensive and integrated three months training programmes on different aspects of food and nutrition periodically for the benefit of the teachers. The programme could be arranged by a Central Committee and various concerned Departments in the States and Central may be associated to utilize the technical personnel and facilities already available in conducting such training programme. It is mentioned that the Central Department of Food has got necessary facilities and technical personnel, who may also be available in rendering assistance in the training programmes.

NUTRITION EDUCATION IN TRAINING COLLEGES— PRESENT POSITION AND FUTURE PROFILE

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"In too many instances, children who finish schools seem rather less fit to become creative and constructive members of their own community than if they had never been to school..... In these circumstances, an educational system only too easily becomes an instigator of maladjustments and unemployment rather than an essential source of growth and development. The boys and girls coming out of schools in India fail to find the employment which they expect. An irrelevant education breeds discontent and frustration at all income levels. In the poorer sections, this problem weighs an ominous burden on the entire social structure." Lester Pearson in Partners in Development-Report of the World Bank Commission (1969).

Education is a high-yielding investment, only when it is of the right type and meets the real needs of a particular situation; when it is reasonably efficient and when the essential environmental precondition and complementary components are present to ensure the effective utilisation of the educational results.

Judged by these criteria, much of the education in our schools and colleges, today is of low productivity value because:

1. The content is often obsolete and wasteful,
2. The educational process is not properly manipulated, and
3. The fruitition is poor.

'Mal-education', has thus imperceptibility reached epidemic proportions in India, poses a potential threat, not only to food production directly but also to the effective distribution of food and hence to good nutrition.

Adolescent pupils are victims of several nutrition-related health problems, some of which are :

1. Poor food habits
2. Poor dietary intakes

3. Growth retardation
4. Anaemia
5. Poor learning abilities.

In the absence of nutrition education, teen-agers tend to develop poor eating habits which affect their health. Their eating habits reflect the influence of the social, economic and cultural environment in which they live and study.

One of the goals of this national seminar should be to incorporate nutritional knowledge in secondary schools. Through practical programmes school children should be helped to inculcate the habit of eating nutritious foods. In order that school children can get a sound knowledge of nutrition, the teachers should be trained in nutrition. Hence administrators, teachers, parents and leaders all who are interested in the nutritional status of the adolescents should help to achieve this goal.

The objective of nutrition education is improvement in the nutritional status of the population. Improvement in nutritional status requires change in behaviour in relation to food and eating. Mobilizing the pupils' interests and channelising their activities in new ways through the curriculum, programmes, communication process and bringing about social changes, should be the functional aspects of teaching nutrition.

Observation and experiences in the Teachers' College reveal-that:

1. Outside the subject of Home Science, very little nutrition is taught to the future teachers. It is difficult to convince the teacher trainees that unsatisfaitory diets are detrimental to education.
2. Evn within the subject of Home Science, the teaching of nutrition depends upon the importance placed on it by the individual teacher. The teaching of nutrition is not generally integrated with other school subjects and not applied to the practical situations. It is just an examination oriented exercise. Lack of suitable teaching aids also hampers the teaching process.

   Growth retardation and poor physical development of school children is a real problem, leading to drop-outs and poor academic performance. Generally the poorer the area, the poorer the diet is nutritionally.

3. Some of the teacher trainees hold the preconceived ideas that 'bood nutrition' costs too much and is, therefore, not practical.

This position and attitudes need to be changed so that better 'food patterns' can be established by the teen-agers as preparation for adult life.

There is thus an overwhelming evidence of the need for incorporating 'Nutrition Education' in the teacher education programmes, for teachers and pupils. Nutrition programmes should stress the need for consuming adequate calories and nutrients during the school days. It should create in children, sound lifelong nutritional habits and an awareness of nutrition as a preventive health measure.

Recomendations

1. Nutrition and health education must be introduced in all the secondary schools as part of the core subject—General Science. Provision of adequate number of teaching periods for nutrition education is essential. Annexure I gives the components of such a provision, which is under the consideration of the State of Tamil Nadu has recommended inclusion of nutrition at all stages of general and professional education.
2. Teachers should be trained and encouraped to integrate teaching of nutrition with other school subjects, e.g., the geography of hunger, the use of nutrition literature for comprehensive exercises in English and Languages.
3. The school lunch (Mid-day meals) programme must be extended to secondary schools also.
4. Secondary and high school children should be involved in nutrition programme, so that they are trained for future roles as food producers, consumers, and parents.
5. Implementation of the above recommendations would become a possibility only when teachers have received instruction in nutrition education and health aspects. The teacher training programmes must have nutrition education. The University of Madras has included a 30 hour syllabus as given below.

Nutrition Education for Colleges of Teacher-Education—University of Madras.

1. Nutrition as fundamental to life. Nutrition as science of living : Integration of nutrition in the educational system.
2. Nutrients and their functions.
3. Nutrient composition and functions of food—Nutritive value of : Milk, Meat and Poultry, Fish and Eggs, Pulses and Nuts, Green and Yellow vegetables, Fruits, Starchy Food and Miscellaneous.
4. Nutritional status: Outward signs of good and poor nutrition. Relationship of 'weight for height and age' to nutrition. How weights and heights are recorded accurately. Record of class weight and heights.
5. Food sources of different nutrients—calcium and phosphorus. Sources of vitamin D, diseases of the bone due to nutritional deficiencies.
6. Energy : Sources—Trapping of energy by plants. Units of energy.
7. How to calculate energy requirements and calories in foods. *Human requirements of energy. Effects of* caloric malnutrition on the body.
8. Food sources of carbohydrates. Their utilisation by the body.
9. Proteins : Building blocks and their functions in the body. Proteins of plants and animals, mixed proteins of foods. Daily requirements. Principal food sources. Diseases caused by protein insufficiencies.
10. Teaching nutrition in Literature and Language: Names of Foods, farmyard animals and food utensils for teaching vocabulary, spelling, parts of speech, composition. Teaching rhymes and riddles about food. Emphasize foods and their production in drama and literature, e.g., foods in the literature and Bible. Effects of religion on food habits. Division of land into four types as seen in Tamil literature and the food habit of the people in these areas—Food referred to as 'good for health', 'delicious' and 'foods meant for guests' as seen in Tamil Literature.

11. Teaching Nutrition in Arithmetic and Mathematics: Counting cards on foods, addition, substraction, multiplication and division in shoppng and catering. Percentages and averages with class weights and heights; weights and measures of food. Time of day and dates of meals and festivals. Monetary systems and marketng. Area of fields for quantities of seeds.
12. Teaching Nutrition in History: Indian History: hunters and cave dwellers and their food habits. Coming of the Aryans with their cattle, agrarian influence. Buddha and his vegetarianism. Factors influencing the food habits of the people during the time of Greek and Persian Invasion—Guptas—Tamil Kingdom—visit of the foreign travellers. Asoka and his influence. Moghal rule and exchange of food habits. Akbar the great. International exchange of ideas; caravan routes, crusaders, Marco Polo. Discovery of the New World. Traders and missionaries. Wars, famines and migrations. British Period—Rural reconstruction. Indian Constitution. Cooperation and voluntary bodies.
13. Teaching Nutrition in Geography: Climate and rainfall. Effects of crops. Maps of chief crops and animals reared by regions. Irrigation and water supply, effects on food and nutrition. Trade winds, trade routes, industries. Sea, rail, road and air transport, population and demography. Five-year plans for agriculture and nutrition. Man's environment—food from the sea and land—water and soil-types of soils and foods that grow well in those soils—Food atlas.
14. Teaching Nutrition in Science; Nature study of plants and their edible portions; stages of plant cultivation, growing seeds in the classroom.

Teaching Nutrition in Botany: Food groups, Exchange list. Teaching the concept of the three 'gs', 'go', 'grow' food; 'grains', 'grass' and 'greens'. Types of teaching aids for demonstration teaching.

Observing the condition of dirt and refuse in vegetables before cooking. Farm stock and their fooder. Signs of *good and poor* nutrition in local animals.

Visiting food mills and bakeries.

Teaching the "3 gs" and functions of nutrients with graphs and charts of skeletal, circulatory, muscular, respiratory and digestive system; organs, their functions and relationships to nutrition.

Food-producing factories. Farm animals, birds, fish, plants.

Elementary chemistry; minerals acids, bases and salts, their place in nutrition. Hardness of water, effects of heat on starches, fats, proteins; listing out the plants, parts of plants, vegetables, fruits, and the greens that form food to men.

Soil and nutrition; nitrogen cycle and food proteins. Growing plants bearing vegetables and fruits in-doors and in the minimum space available in the garden.

15. Living organisms that form food to man—Animals that contribute food to man and their nutritive value.
16. Teaching Nutrition in Arts and Crafts; colour pictures of foods and farm animals. Make posters and charts of foods. Embroidery of dresses with fruits and vegetables. Woodwork; cupboards for storage, dining tables, pottery, cups, plates and bowls.

Conclusion

Many opportunities can be found both inside and outside the school to extend nutrition education. Groups of students may take up project work to show others the impact of the knowledge in particular subjects on good inutrition. Vocational training, could include actual work in bakery, fish pond maintenance, school garden, poultry, piggery, fish and raising cattle. These items of work may be designed not only as a learning experience but also as an economically gainful employment opportunity and work experience.

APPENDIX

1. Foods and Nutrition

Local food habits are basically sound. Explain why.

How to improve without raising cost: use mixed cereals, mixed dals, greens, leaves, cheap fruit, milk powder.

Conserving food nutrients, e.g., throwing away rice water.

Wrong local food concepts, e.g., no solid food for children; food avoided during pregnancy and lactation, etc.

Cheap nutritive menus using natural foods.

Importance of breast feeding.

Cheap home-made nutritive foods for children.

Weaning concept.

Kitchen gardens, poultry, milch animals.

2. Health and Hygiene

Boiling water and milk.

Keeping food covered.

Flies and dogs.

Wells.

Deep latrines.

Toilet training of children.

Sun rays for sterilization.

3. Motherhood and Family Planning

Facts of conception and birth.

Rising population, more food but less to eat.

More babies per family, less death.

Death rate of babies is going down, hence small family is enough.

Food cost for bringing up a baby.

Food and brain growth.

Methods of family planning.

ANNEXURE I

Syllabus in Nutrition and Family Living in Schools : Food and Nutrition

FIRST YEAR

Functions of food–Good food habits. Constituents of food–Food groups. Mixed diet–Balanced diet.

SECOND YEAR :

Food preparation–Devices and methods of cooking and serving foods.

THIRD YEAR :

Planning meals–Diets for special conditions in health and disease. Food spoilage–Food preservation.

Foods and Nutrition
FIRST YEAR

Area		*Concept/Topics/Lessons*	*Experience to be provided*	*Number of periods*
Foods and Nutrition	1.	Different foods cater to different needs of the body, namely, energy giving, bodybuilding, maintaining health and developing resistance.	Display different foods and explain their nutritive value and function.	20
	2.	Good food habits are to be followed to maintain optimum health.	Let pupils correlate their heights and weights at different levels and observe the growth of animals.	
	3.	Foods contain the nutrients, carbohydrate, fats, proteins, minerals and vitamins in varying amounts.	Explain the need to have various nutrients using charts, flashcards and actual food.	
	4.	The need to have those nutrients, the amount required, the deficiency diseases, and the foods and rich in these nutrients are to be known by all.		
	5.	Good, fresh, low-cost and nutritious foods are to be selected from the different groups of foods to have a mixed diet.	Explain food groups and the nutritive value of foods using posters and leaflets.	
	6-	Balanced diet should be taken to maintain the health and to promote proper growth.	Explain with the help of charts, posters, flashcards and foods and group them according to their nutrient content.	
	7.	Diet for a day should be planned to meet the nutritional requirement of an individual for a day.	Let pupils plan adequate diets for their families and calculate their cost.	

SECOND YEAR

Area	*Concept/Topics/Lessons*	*Experience to be provided*	*Number of periods*
Foods and Nutrition	1. Food is prepared in many ways.		15
	(*a*) There are certain merits and demerits in each method of cooking.	Give example of food preparation for each method and demonstrate.	
	(*b*) Some foods are served raw without cooking.	Demonstrate and display the raw food servings.	
	2. Serving foods neatly and attractively is important.		
	3. Devices like Hay box, cooker, Janata refrigerator, electric refrigerator, flasks, hot plates, freezer and ice boxes are used to maintain the temperature of food.	Show the devices and explain.	

THIRD YEAR

Foods and Nutrition	1. Planning of meals helps in getting the right type of food in the right ways.	Divide the pupils into groups and let them plan meals for different stages. Tabulate the requirements and display.	15
	2. Special diets should be prepared for special purposes.	Demonstrate the preparation of different diets and explain their uses.	
	3. Food is spoiled due to many reasons.	Show the spoiled food and explain the reasons.	
	4. Foods are preserved at home in many ways.	Demonstrate the procedure like preparing pickle, jam, jelly and squash and other preserving techniques. Explain other methods giving suitable examples.	

NUTRITION EDUCATION IN TRAINING COLLEGES: PRESENT POSITION AND FUTURE PROFILE

Smt. Bani Sen, Principal, Jawahari Devi Birla Institute of Home Science

The object of this study is (a) to analyse the present position of nutrition education in training colleges and (b) to suggest learning experience to be incorporated in their study course in the field of nutrition.

It is expected that with a better understanding of food and nutrition the teachers would likely be in a happier position to help (a) school children (b) the learners and (c) the parents to bring about a desirable standard in their food habits.

Limitations:

(1) The study is limited to the analysis of the training colleges of West Bengal state only.

(2) It needs to be noted that no teacher in any particular situation is expected to cover all the experiences that have been listed in the profile. It is only a guide stating the possibilities. The appropriate experiences are to be selected by the teacher and the learner in relation to their needs.

It is assumed that:

(a) the analysis of the existing curriculum and syllabus of training colleges would provide some indications of the needs of student teachers in the field of nutrition education.

(b) the profie will suggest understandings on which an effective nutrition education programme may be developed for training colleges.

Justification of the Programme

Nutrition is a subject of national importance. It is the foundation of good physical and mental health. The immediate relationship of food to the health of the individual extends to become an influence upon the health of the society in which he lives. It has been said that "Nutrition is the science concerned with the movements of atoms in man to the movements of man in society."

From the point of view of psychologists food is a basic need of human beings. From the point of view of physiologists and medical doctors, good nutrition is the foundation of good health. The retarded physical and mental growth of our youth is more often than not a result of under nutrition. According to educationists, education is the cornerstone of good nutrition. This is mainly because it is primarily the responsibility of the educators to help the individual to understand what is good nutrition, good food habits and how to change nutritional needs. It is his responsibility to teach what are the different choices for meeting the requirements.

In India, nutrition presents a problem for all income and age-groups. (U.S. Agency for International Development. A study of food habits in Calcutta, New Delhi-1972). A recent survey conducted by USAID on food habits of people in Calcutta showed that almost all age groups are short of the required calories, proteins, vitamin A, iron and calcium. Nutritional inadequacy is more critical among the majority of the population in the lower expenditure level households. Because of the tremendous population explosion and food shortage with resulting starvation, we often come across unrest and revolt among the people. As the income increases and food supply is adequate the problem may be of a different nature. Although good choices may be available, lack of nutrition knowledge or the presence of firmly established tradition and religious customs may interfere with wise choices in food which may ultimately result in dietary deficiencies. The health, productivity and life span of the individual are thus determined by how he selects his diet and what selection exists for him. These are learned traits and not attained by instincts. An important lesson yet unlearned is that of changing food habits with the changing physiological needs and shifts in environment and also learning the alternate sources of good proteins and other nutrients. It is not always necessary that all proteins required should be of animal origin. That can be obtained from vegetable sources at low cost and that they are perfectly supplemented.

Various dietary abuses have created or contributed to other problems: dental caries and chronic disorders of body system. There are a number of deficiency diseases which could be avoided if only one has sufficient knowledge of good nutrition. In human nutrition little is known about the delayed effects of early malnutrition but we have reasons to believe they occur. Long time dietary patterns of human being might affect the enzyme system also. Poor sanitation can cause a hazard to good nutrition by causing infectious diseases and hence indirectly that needs to be emphasised in nutrition education. Education is important to many aspects of the problem. If incomes are adequate people must be taught how to choose wisely. If the problem is shortage of foods remedies must be found for the root causes of those shortages before the dietary problems can be attacked. This too may be on educational matter. People can be taught how to grow more food, prepare, preserve, store them effectively and consume advantageously.

As a teacher of the primary, middle and high school one can impart a practice working knowledge of nutrition more effectively to the student than any one else. He can convince the student that his diet is a matter of personal responsibility and that it also has social impact. For example an ill nouri hed child can be a health hazard to his class mate. When a housewife has unsound eating habits, the family may suffer from her apathy, fatigue, decreased efficiency, hyper irritability, etc. Thus, the food habits affect other people as well.

We know, of course, that the ideal situation seldom exists. That is true in nutrition education as well. Unfortunately, we cannot reach every one through a complete course in nutrition. If there are no impediments, we would begin by reaching all children with basic facts at an appropriate age. When school curricula are crowded, it may not be practical right now to offer a full-fledged course in school. But it could be arranged through some effective means like planned teachers association, home visits, students counselling, etc.

In order to prepare the "would be teacher" to all the schools with a sepcialized function like the one which is just discussed, there should be sufficient to any for the teachers in the some area to guide the students effectively. Therefore, there exists the need for including nutrition education in training colleges. As is revealed from the present position, nutrition education is far from adequate to prepare them for the great task ahead of them.

Present Position

Let us first consider the present position of nutrition education as prevailing in West Bengal. Though training is a very wide term—covering various types of education. Teachers' Training Colleges have come to be known as colleges which offer training to teachers to impart some form of education to children, adolescents and even adults. From the standpoint of an eligibility for admission in various training colleges—these colleges may be broadly classified in two groups. In the first group only graduates are eligible for admission. In the second group, the minimum qualification for admission is School Final and in some cases Higher Secondary. It is still being debated whether training colleges which admit school final or higher secondary passed, are regarded as undergraduate colleges and must train teachers for nursery, elementary and middle school teachers.

Depending on the methodology of teaching and the content of teaching 'Post-graduate' training colleges for general education may be of five categories; (1) B.Ed., or B.T. colleges which are affiliated to the Universities which confer degrees, (2) Post-graduate basic training colleges which are recognised by Education Directorate, Government of West Bengal and students on successful completion of the course are awarded diploma by the Government, (3) The third category refers to colleges for physical education which offer courses to teachers or prospective teachers in physical education only. While Kalyani University runs college for physical education and offer B.Ed., degree in physical education to the successful students, the other college at Banipur is recognised only by the Government of West Bengal and successful students are awarded Diploma by the D.P.I., (4) Technical Teachers' Training Institute admits students with degree or diploma in Engineering and the Institution is recognised by the Government of India, (5) Last but not the least is the B.Ed course in Home Science. This course is affiliated to Jadavpur University and is run by the Jawahari Devi Birla Institute of Home Science. It is open to graduates in Home Science only. There is also a college under Calcutta University which offers post-graduate training diploma course in Home Science. The minimum qualification prescribed for admission is a general degree.

Undergraduate training colleges are recognised by the Government of West Bengal and not by the University. There is only one course—Early Childhood Education which is affiliated to the Jadavpur University. The following types of Teachers training courses may be mentioned.

1. Junior basic training course offered in a number of colleges in West Bengal. (Minimum qualification for the admission—School Final).
2. Senior training course offered in a number of colleges in West Bengal. (Minimum qualification for admission—School Final).
3. Early Childhood Education. (Minimum qualification for the admission—Higher Secondary).

We shall first of all consider provision of nutrition education in Post-graduate courses by which I mean courses which students join after the graduation. In the B.Ed. course of Calcutta University, in the syllabus of health education there is just one topic—school meal. It discusses perhaps the desirable menu of school meal, how to iorganise and finance it. In the post-graduate basic training course, nutrition education has a greater place. In one theoretical paper under health education there is a topic "causes of malnutrition and its treatment, school meal and tiffin". Cookery forms a part of home craft included under an elective of practical. If cookery stresses methods to preserve the nutritional value of foods to be cooked, it has some reference to nutrition education. In the course of physical education food and nutrition has an important place. There is hardly anything about nutrition in the technical teachers' course.

The students joining B.Ed., course in Home Science come equipped with considerable knowledge in Food and Nutrition which they have studied in the B.Sc.. course. They are required to acquire at the B.Ed. level advanced knowledge in nutrition as well as knowledge in Community Nutrition which in turn is strengthened by a programme of health education and Adult Education. In the Post-graduate Teachers' Training Diploma course under Calcutta University, there is an independent paper on cookery and dietetics and also a method paper on schools diet and cookery. To many of these students food and nutrition is a new subject.

Under the category of under-graduate teachers' training courses let us first consider curriculum and syllabus of junior basic training colleges. In the syllabus of health education, nutrition is a fairly broad topic (1) constituents of different types and their food value for the growing child and (2) prepare diet chart for the age group 5—11" are mentioned. In the senior training course "food values, proteins, carbohydrates, vitamin A to D, balanced diet" are taught under health education. In the course, offered in Nursery, Infant and primary school teachers' training the following topic has been included in the method teaching health sciences including physical education, 'teachers role in supervision of food consuming at school, in respect of sufficiency, cleanliness, eating habits' and under the exercise of methods of teaching health sciences it has been laid down "organization of health exhibition, nutrition needs of children in connection with mothers' day construction of health and nutritional posters, etc." In the Early Childhood Education there is one full paper on Food and Nutrition.

Future Profile

In developing a profile for a course like foods and nutrition the critical task would be to tackle the problems from the point of view of the individual, the family, the community and the nation as a whole. Outline should be directed towards developing:

1. Values, attitudes and appreciations.
2. Understanding information and principles.
3. Abilities, skills and techniques.

I. Teachers' objectives for the first category should be to help the learners to develop and appreciate the following:

A. I. The importance of (a) production, selection and prepartion of food; and (b) conservation of food values for maintaining good health.

2. Importance of cleanliness and sanitation in handling food for avoidance of diseases.

3. Aesthetic values of food, in preparation and service in relation to appetite.

4. A willingness to experiment with new foods in the menu for securing better nutritional standard.

B. Develop a positive attitude towards food and nutrition.

C. Develop a better understanding of the effects of food on maintaining the health of the learner as well as the health of the family members.

D. Consider food in relation to the economic standards.

E. Develop interest in keeping acquainted with the latest development in nutrition.

F. Appreciate the importance of the kitchen as a work centre.

II. Teachers' objectives in terms of the second category should be to help the learners.

A. To develop a better understanding of:

1. The scientific standards of nutritional requirements (a) according to age and occupation, (b) pregnancy and lactation.

2. Requirement of food during the different methods of food preparation.

3. The factors to consider in buying and selecting goods.
4. The seasonal harvest in relation to diet.
5. The hygienic and labour-saving kitchen equipment.
6. The desirable standards for community eating places like hotels, restaurants, canteens, etc.

B. To become more familiar with :

1. Food policies of the government.
2. Food habits and food fad and fallacies existing in the locality.
3. National and international food organisations.
4. School lunch programmes.

C. Recognize the relation between diet and diseases.

III. Teacher's objectives for the third category should be to help the learners :

A. To develop ability to :

1. Prepare food budgets for different income levels.
2. (a) Plan, (b) prepare, and (c) serve food from and aesthetic and nutritional point of view.
3. Handle (a) materials, (b) tools and (c) equipments necessary for food preparation and service.
4. Make practical application of the available technical knowledge to (a) prepare, (b) preserve, and (c) serve foods.
5. Formulate standardised recipes.
6. Kitchen gardening.
7. Identify individual needs as a basis for providing appropriate learning experience.

Possible approaches in solving the problems may be done through :

1. Use of exhibits in forms of fresh materials, where possible.
2. Laboratory experience and demonstrations showing the results of good and poor nutrition.
3. Films and slides.
4. Role playing.
5. Use of books, periodicals. bulletins, newspapers, etc.
6. Home experience.
7. Illustrative materials as charts, posters, etc.
8. A good album of collected clippings.
9. Use of resource persons.
10. Maintaining records of evaluation.
11. Field trips to local establishments such as markets, grocery store dairy, public eating places, clinics, rural and urban health centre, neighbouring houses, etc. Better results may be expected, if the learners are inspired with a feeling that they are contributing valuable help to their families, their communities and their country in achieving a common goal.

IMPORTANCE OF TEACHERS' TRAINING IN NUTRITION EDUCATION

Dr. P. N. Sen Gupta, Calcutta

Education in nutrition is a necessary part of the practical programme to improve human nutrition and requires appropriately trained personnel. It is important that the personnel selected for training should have the proper qualifications and personality which will ensure their usefulness in developing national and community programmes of education in nutrition.

The solution of nutrition problems depends to great extent on the sound economic and agricultural development of the country and on the amounts and kinds of food available at reasonable prices. But it is well recognised that food habits and cultural patterns which affect nutrition and malnutrition, is often the result of ignorance and prejudice. Only educational programmes which reach the different groups of the population can remove such ignorance and prejudice. Programmes of nutrition education should, therefore, form a part of national programmes for the improvement of nutrition and should preferably be co-ordinated with other activities for nutritional improvement.

There are various reasons for developing sound programme of nutrition education in the schools and in the community to:

1. Prevent malnutrition caused by deficiency of protein, calories, vitamins and minerals present in food;
2. Promote physical and mental development through choice of nutritious foods;
3. To encourage people to use their money for better or more nutritious foods;
4. Strengthen the inter-relationship between the home and the school in effecting improvements in diet;
5. Relate agricultural production to the food requirements of the people.

The principal target of nutrition education is the family. In rural societies families produce most of their own food supply whereas in the urban communities food is usually also a family affair. Most families eat at least some of their meals together which has profound influence on the development of eating habits and attitude towards food. Although specific projects are often directed towards certain groups notably mothers and children, educational programmes should be planned keeping in mind the needs and interests of the whole family. Here is the importance of the programme, therefore, objectives or aims of nutrition education in the primary schools should be to educate the family at the initial stage through the primary school child. The programme of education in nutrition is most effective when a co-ordinated approach is used. For example, the mothers may be reached through women's extension service, health services and social activities, children through nutrition education, gardening and school feeding of supplementary feeding programmes, older boys through youths clubs and rathers through agricultural extension services.

Education in nutrition can reach the people through various channels of which the following are probably the most important :

(a) Schools;

(b) Maternal child health and public health centres;

(c) Community development and related programmes;

(d) Agricultural and home-economics extension services.

However, we are concerned in this Seminar only with the nutrition education of school children and teachers.

Education and training in nutrition in schools are now becoming practical. They are often associated with health education, school feeding programmes and other activities. The introduction of nutrition teaching into school curriculum and into the course for school teachers is of special importance. Such teachings should take into account of the local conditions, availability of foods and customs.

The goals of nutrition education fall into three main areas: (1) an acquisition of knowledge about the principles of nutrition and their application to daily living, (2) development of attitudes to food and knowledge of food values, and (3) the formation of good food habits. In formulating a syllabus in nutrition education, there are certain other considerations, for example, the special need of children at different age levels, the availability and cost of various foodstuffs, the health and economic status of the people and other local facts such as beliefs and prejudices. It is, therefore, necessary to have information on the nutritional status of the population and their health needs as well as cultural patterns. It is also necessary to make periodical evaluation of the programmes of education in food and nutrition.

The teachers have great responsibilities in nutrition education but these vary from one community to another. They may have many opportunities in the rural areas but few in the urban areas. A school meal programme that involves collaboration between parents and teachers is a good example of such opportunity. In promoting nutrition education in schools, it is both possible and desirable to co-ordinate this programme with other related programme in the schools such as school gardens, school poultry projects, etc. Such activities not only serve to teach and demonstrate modern methods of food production but may also be used to emphasize the nutritive values of foods produced.

A certain measure of education is necessary in exerting teachers' responsibility in the community. He is not to over emphasize his position in this connection. Not all teachers can be advisers or leaders in their communities. Many countries are obliged due to lack of funds to employ inadequately qualified persons to perform their normal teaching duties. They should not be burdened with additional responsibilities.

Teacher-training programme must be geared to prepare the teacher for whatever extra classroom responsibilities he might be expected to shoulder. Their are many difficulties in the planning of such programmes for training of teachers in nutrition. Three types of training are envisaged for three groups of teachers:

1. The preparation of future teachers in different types of teacher-training institutions specificially devoted to this purpose.
2. The training of those who are already practising teachers but have received no training in such institutions.
3. The refresher course for those teachers who are already qualified but who have had insufficient instruction in nutrition education.

With reference to Group 1 the problem is how curriculum on nutrition education could be introduced when their programme of education is full and it is difficult to introduce new topics. But some related topics are already in the programme like health education, home economics, hygiene, etc., which already contain some aspects of nutrition. These and other aspects may be developed. Nutrition education should be introduced into the curriculum of all training institutions either as a separate discipline or to be integrated into the existing disciplines.

Area of knowledge which should be included:—

(a) Basic knowledge in nutrition, diets, foods, food principles.

(b) Importance of the diet for vulnerable groups, e.g., young children, mothers and ability to recognise signs of malnutrition.

(c) Problems of food and nutrition at community, regional and national levels.

(d) Agricultural, economics and socio-cultural factors concerning foods.

(e) Food management production and availability, selection preparation and conservation.

(f) Food hygiene.

(g) Nutrition education, in particular the methods and techniques the teachers will be expected to use in the schools, audio-visual aids.

(h) School feeding programmes, knowledge about their organisation management and participation.

(i) The school garden plot and domestic animal breeding as source of protective food for home consumption.

(j) Planning of nutrition and nutrition education programmes.

(k) The value of nutrition education in the community and how this can be influenced by the schools.

The needs of the teachers indicated in groups (2) and (3) have to be met mainly by in-service training courses. Suggestion are given here:

1. Regular refresher courses either during the school year, school holidays or by giving special leave to the teachers to attend.
2. Correspondence course.
3. Locally arranged lecture courses, workshops, meetings, exhibitions.
4. Documents made freely available to the teachers.
5. Exchange of information and of teachers, inspectors and supervisors locally, nationally or internationally.
6. Availability of money for study leave, fellowships, etc.

It is best to encourage and invite those teachers who would be most likely to profit by such courses. In other situation two-weeks courses may be organised and selected teachers are invited. Such courses should be conducted by people who have themselves undergone intensive course for four months in nutrition education. Reliable information should be made available to the teachers.

Finally, even with proper training, the teacher will require advice and assistance of specialists in nutrition education and related subjects and their work will always need supervision.

NUTRITION AND INFECTION (ABSTRACT)

Prof. K. L. Mukherjee, Calcutta

Malnutrition impairs the antibody producing capacity of the body. It is also found that the metabolic activity of the phagocytes is reduced in case of ill-nourished children. In Africa, the poor families are effected by measles, whereas the well-to-do families are less effected If any foreign chemical is injected into the body—immediately there is response. But in marasmic children—this *cell-mediated responsiveness* is reduced. In ill-nourished school going children the ability to respond to infection is poorer.

INTERACTIONS OF HOME, SOCIETY AND SCHOOLS IN IMPLEMENTING NUTRITION EDUCATION PROGRAMME (ABSTRACT)

Km. Keerti Sawhny,
Indian Council for Child Welfare, New Delhi

1. Extreme importance of early childhood years :

(a) i.e., from 0–6 years as the formative, impressionable and crucial years for development.

(b) as the age at which contact with the home and the family is possible.

This become extreme important in the event of the integrated child development project being launched in the 5th plan by the Govt. of India—aiming at training. Multipurpose field level workers (Balsevikas) to be utilized in Balwadis.

At present the I.C.C.W. is running 27 Balsevika Training Centres in 18 States—the duration of the training is 11 months. A new revised syllabus has been drafted to give simple practical knowledge.

It needs to be stressed that specific educational aims for various groups—mothers, pre-schools, teacher educators need to be identified for maximum effectiveness.

The NCERT could help devise teaching aids, reading materials, etc., which may be utilised in these programmes.

GUIDELINES FOR IMPLEMENTING NUTRITION EDUCATION IN SCHOOLS AND COLLEGES

Dr. Amiya Kumar Bose,
President, Indian Dietetic Association

At the outset, may I, on behalf of Indian Dietetic Association, congratulate the National Council of Educational Research and Training for organising this Seminar on 'Nutrition Education'—a subject with which our Association is deeply involved. Since the inception of our Association we have been harping on the introduction of Nutrition education at the school level and naturally we are happy that the Department of Education has at long last made a move in the right direction. I hope the deliberations of this Seminar would not only offer guidelines to the Government for incorporating the subject of 'Nutrition' in the curriculum for both the Schools and Colleges, but would recommend an integrated programme for educating the masses.

India is passing through a very crucial period. In recent months the food shortage has assumed such a gigantic proportion that thousands of people are affected and many are dying of hunger, inanition, and malnutrition. We hope that the food situation would improve soon. But we cannot expect food sufficiency in near future. It is our duty as nutritionists to guide the people as how best to utilise whatever is available. It is a very difficult task—it calls for patience, tact and ingenuity. Even then the results are discouraging and often frustrating. The task would have been easier had the people been nutrition-conscious.

The food habits of our people differ not only from province to province but they even vary in neighbouring districts. No programme for nutrition education could be effective or successful unless due considerations art given to the tastes and attitudes, preferences and prejudices of the people concerned. The means and methods of the nutrition education have to be devised in such a way that they have to be region-oriented, pragmatic and interesting.

The purpose of this Seminar is to discuss, deliberate and draw a syllabus for teaching nutrition in Schools and Colleges. But mere inclusion of the subject will hardly help. The hygiene has been taught to the students for decades but what has it achieved. The theoretical knowledge without practical application or proper environment has lost its meaningful purpose.

It has been observed that social changes come naturally in all societies, however, primitive, in course of time, but food habits are much deep-rooted and, therefore, need planned efforts to hasten the process of change.

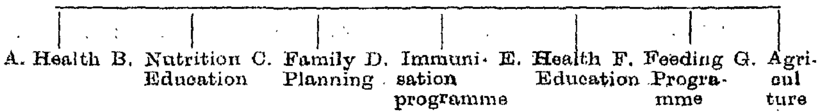
In absence of the encouraging environment of the family and society, if the teaching of Nutrition is started in higher classes when the boy or girl had already acquired some definite food habits and fixed attitudes it will lead us to nowhere.

In India, with chronic food shortage the importance of nutrition education cannot be too strongly emphasised but it would be utterly ineffective if it be limited within the text books. Students will accept the study of Nutrition as an extra subject meant for cramming for the sake of passing the examination and to be promptly forgotten to make room for a new subject to be studied next year. The teachers and heads will grudgingly bear with the intrusion of Nutrition as another unwelcome burden and possibly an under-nourished teacher of History or Algebra may reluctantly teach the students the principles of diet and nutrition. The purpose will thus be defeated.

Integrated Programme

To achieve the goal, nutrition education should be made a part of an integrated programme and it should be a continuous process starting from the antenatal clinics right up to the old age. Children should be born and grow up in the environment, where the family is interested and enlightened with the principles and value of diet and nutrition. The problems of nutrition cannot be viewed or tackled in an isolated manner in a country like India, infested with various ills and maladies. Neither a national programme for nutrition alone likely to have far-reaching effect unless inter-related problems such as diseases, population explosion, health and sanitation are simultaneously dealt with. It should be a comprehensive programme of which nutrition education in schools would be an integral part. I consider that the course on Diet and Nutrition in Schools should be treated like an element in the Jig-Saw Puzzle, which has to slip into the right place to give the correct shape to the motive for which it has been designed.

Integrated Scheme



The personnel to be involved are :

1. Doctors and Indian Medical Association.
2. Nutritionists and Dietiticians.
3. Social Workers.
4. Health Visitors.
5. Vaccinators.
6. Agronomists.
7. Field Workers involved with feeding programme either or voluntary organisation like CARE, CASA, Ramakrishna Mission or Government agencies.

Nutrition Education

1. Antenatal Clinic.
2. Postnatal Clinic—Family Planning Clinic and Baby Clinic.
3. Childhood and Adolescence—Pre-school Feeding—Programme School.
4. Adults—College—Home and Society.
5. Teachers Training Programme.

1. Antenatal Clinics

At no time a woman is mere receptive than when she is expecting. Why should we not utilise these clinics for educating expectant mothers while they are waiting in the clinics be it urban or rural?

2. Postnatal Clinics, Family Planning and Baby Clinics

In these clinics the mothers have to be impressed and taught about the value of early initiation of mixed feeding. Posters, pictures and pamphlets can be offered in addition to practical demonstration to make them more interested. Nutrition educationists have to work here hand in hand with social workers and vaccinators. Where mothers are defaulters, health visitors and nutrition educationists could visit their home to guide and educate them.

3. Childhood and Adolescence

Home — The food habits and attitudes are as deeply rooted as religious beliefs and taboos. Conversion to a different type of feeding programme presents the same degree of resistance and revulsion as conversion to another religion. So the most promising approach should be to 'Catch them young'. If food habits are modified at an early age, children will develop liberal attitude and would readily accept unorthodox if that be necessary.

Without active co-operation and encouragement from the family particularly mothers it will never be possible to train the children to acquire variable food habits.

Pre-school feeding programme — The programme of feeding the pre-school children has been launched by our Government as a major project. The results are encouraging. The incidence of malnutrition amongst the beneficiaries are decidedly low. But will it have any permanent effect as far as nutrition education is concerned? There is no proper participation by the parents in these programmes. They maintain the attitude that since they cannot afford they send their children only for the benefit of a free meal. Voluntary organisations life Ramakrishna Mission, CARE, CASA, etc., are actively participating in these programmes. The workers who are serving either such voluntary organisations or Government agencies are not adequately trained to impart knowledge of nutrition to the beneficiaries. What a vast opportunity is being wasted. These dedicated workers could easily be trained up to act as nutrition educators and they could be impressed upon to seek the participation of the parents to whom they could explain in simple language the value and advantages of the food that the children are having.

School — In a children the interest in food and nutrition should be started as early as possible. It would suggest that attempts should be made to make them familiar with some terminology at the stage when they learn their alphabets. The syllabus could be suitably revised to include some terms which they would learn rather involuntarily—some rhymes could be composed which when they memorise would leave a lasting impression. **As for example:**

A For Apple—Apple a day keeps the doctor away.
C —Calories or Carbohydrate.
O —Oil.
P —Protein.
V —Vitamins.

The trend of imparting knowledge of food and nutrition in some form or other should continue through at the school career. The earlier years should be devoted to create interest in different type of food and food habits of people of different states of India and people of different countries. As the children are promoted to higher classes more elaborate and detailed courses could be prescribed. Here I will draw your attention to the fact that most of the text books dealing with food and nutrition need to be revised or fresh books have to be published. Books in regional languages should highlight the regional food habits and preferences, and suggest how to modify or improve them to provide a balanced diet.

The study of nutrition should in no stage be only theoretical. Demonstration, exhibitions and participations of senior students in different feeding and nutrition programmes would sustain their interest in the field of nutrition.

School Meals

In Schools — Mid-day meals or tiffin will offer opportunity for propagating nutrition education. Participation of the teachers and parents once a week in these applied nutrition programmes will be very helpful in creating the right environment. In monthly meets an exhibition or if possible audiovisual programmes could be organised. The children and the parents could be encouraged to develop kitchen gardens.

4. Adults

College — Introduction of Nutrition as a separate and compulsory subject for every university student will not be a feasible proposition, and create problems. Since the students had already acquired adequate knowledge in Nutrition in their schools steps should be taken to sustain their interest in Nutrition. College students are more mature and adventurous and they could easily be pursued to participate in the field works. particularly Nutrition education for the masses and feeding programmes. In case of National Cadet Corps it could be made compulsory as a part of their training programme. The students who will study Biology or Home Science have to undertake an advanced course in Nutrition including extensive practical training. College canteen could be utilised for applied nutrition programme. Cheap palatable wholesome meals made with the orthodox food materials could serve as a medium for nutrition education.

Home and Society

Nutritionists and Dietitians have to undertake the responsibility of training the adult population who did not get benefit for schools and colleges or who could participate as parents in the feeding programmes. Educators should involve group of local people particularly ladies, to initiate interesting discussion, demonstrate applied nutrition programme and apply audiovisual aids to create a lasting impression. If they continue to call on them periodically and sort out their problems and difficulties, the resistance and reluctance for a chngeover could ultimately be overcome.

5. Teachers Training Programme

It is appealing in the whole school curriculum food and nutrition have been alloted only a meagre space and importance in the books of Hygiene. The teachers who are entrusted with teaching Hygiene are not even adequately qualified or properly trained to teach the subject. They have no clue what nutrition stands for. If the study of nutrition has to be placed in the proper perspective and has to fulfil its objective of creating consciousness amongst the future generation, it is essential that separate stream of teachers should be trained up. In addition to extensive theoretical course they should undergo a rigorous practical training. The training programme should include:

(a) Participation in mass feeding programmes and applied nutrition programme.

(b) Study and practical training in Dietetics and Catering.

(c) Visits to Clinics and Hospitals to study the effects of malnutrition and deficiency diseases.

(d) Participation in Nutrition education programme for the masses.

If we want to inspire our younger generation to be nutrition conscious and to develop a more liberal, responsive and adaptable attitude to food, we have to have the service of highly trained but practical and pragmatic band of devoted teachers to shoulder the responsibility.

PRACTICAL GUIDELINES IN IMPLEMENTING NUTRITION EDUCATION IN SCHOOLS AND TRAINING COLLEGES

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A well-nourished population provides a sound base for the proper development of a nation. It is indeed gratifying to note that nutrition has been accorded a significant place by the Government of India so much so that the National Council for Educational Research and Training are considering the possibilities of reorienting the existing curriculum for better nutrition education in schools and training colleges. Importance of nu'ritious food for the school going child becomes obvious when we see the different nutritional disorders from which they suffer. The short stature of many of our children is attributed to the poor nutritional quality of their diets. Lack of sufficient clarories leaves them thin and weak. They cease to be active and may not show the expected progress in studies. All these focus to but one course of action. Something has to be done to make our children nutrition-minded.

At the present moment the little amount of nutrition which is taught in high schools is very much on the theoretical basis. It fails to arise any interest amongst the children. Even at home their families may not give due importance to food for its nutritive value. As a result the child develop faulty food habits in spite of learning nutrition in school. Thus, a more purposeful approach is needed to solve the problem. It is an accepted fact that for sound learning we need to use more than one of our senses, that is why audio-visual aids are needed for better communication. When a child learns by utilising his own experience he learns best. This can most effectively be brought about by introducing feeding programmes in schools.

A feeding programme is effective as an educational tool in more than one way. Firstly, it is bound to improve the health of the child. Next the contact made for feeding purposes becomes a useful opportunity for education. Moreover, food acts as an incentive for regular attendance. The child learns about the food he eats in school by actual participation. The Fourth Plan provides for a number of school feeding programmes under the Ministry of Education and Youth Services. The total outlay is about Rs. 19.18 crores for beneficiaries of about Rs. 180 lakhs. The meals are so planned as to supplement the homemeals. These school meals could very easily be utilised as an aid for teaching better nutrition to the school children. Such a nutrition education programme is working beautifully in Japan for the past ten years.

School Gardens. Yet another programme at the school designed to make the child more nutrition conscious is the school garden project.

Emphasis should be given to growing nutritious fruits and vegetables such as papayas, guava, green leafy vegetables, tomatoes, etc. Teachers and pupils should engage themselves together in gardening activities. Produce from the garden can be used for school meals. Participation in school gardening activities is both entertaining as well as educative. It is a good pastime providing the necessary physical exercise and opportunity to learn about the nutritive value of easily grown foods. The child at the same time gets used to learn work with productive results.

The training of educators for such a practical approach needs re-orientation at the same time. To teach the young the teacher must herself develop good food habits. It has been observed that food habits are changeable at all ages though the progress of change in adults is usually so slower. Serving nutritious foods through canteens in the training college level can be used as a means to create acceptability for unconventional foods of high nutritive value.

I would like to mention here that under the auspices of the Indian Dietetic Association, such a canteen is now being run by trained Dietitians at the Basanti Devi College in Calcutta. At first there seemed to be quite a bit of scepticism about the unconventional foods that were introduced in these canteens such as: soyabean and groundnut recipes, but gradually the response is very encouraging. Moreover, the canteen is serving a two-fold purpose--not only is it helping to change the food habits of the young college ladies but it is also affording training facilities to Dietitians who propose to be absorbed shortly in other similar canteens. "Better Food" canteens can thus be utilized at the training colleges for training the educators for future school feeding programmes. Today's children are tomorrow's citizens. A huge responsibility, therefore, lies on us to see that our children are fed properly and they become worthy citizens. Proper nutritional care at the early ages yields rich dividends in the long run. Let us hope that the discussion in this seminar will lead to the laying of a strong foundation for a concrete and a massive nutrition education programme in our country in the years to come.

SOME OBSERVATIONS ON THE GUIDELINES REGARDING FORMULATION OF SCHOOL CURRICULUM IN NUTRITION EDUCATION

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"Education is the maifestation of the perfection already in man."—Swami Vivekananda

As I would like to interpret this superb definition of the aim of education, I feel that man due to his almost unlimited potential for expansion of consciousness as different from other living objects, can consciously and intelligently interpret his own actions. Animal instinctively indulge in eating because of hunger. So does man, but man alone appreciates the biological mechanism as well as the socio-economic technology involved in the utilization of food for the survival and over all happiness of the species. Thus, the science of food and nutrition must be included as a subject of fundamental importance, because it is intimately connected with the very process of survival of the human race.

The actual curriculum of nutrition education may be incorporated under three major headings namely:

A. Food.

B. Dietetics.

C. Nutrition.

It appears to me that the problem of population and family planning are intimately associated with the problems of food dietetics and nutrition. There are again inseparately connected with the socio-cultural-religious-economic aspects of life. I believe that a wholistic concept should be the ideal for preparation of curricula for any subject and as a teacher I have not good reasons to believe that failure to achieve this wholistic concept has been a major drawback in our educational system as a whole. It is a pity that the piece-meal collection of a host of information crammed into our text books have been the order of the day. My feeling is that the pupil is motivated to read or listen to a complete story from beginning to the end—a complete chronologically arranged inter-connected logically concluded story as a whole, in which the food the available resources. The rationable of preparation and preservation of food, its utilization by the living body in relation to its growth development and differentiation are not put up as separate disjointed facts but as integral parts of one single story whether to call it food science or nutrition or dietetics is just a matter of semantics.

In the beginning another problem needs to be emphasised—the problem of the science of a subject and the problem of technology. My feeling is that the technology, that is, the actual techniques involve are matters of specialization—either for persons actually involved in practising it or for more highly specialised personnel. For instance, the actual techniques of cooking seems to have relevance only to person who are going to cook small quantities of foods themselves either in the home kitchen for the family or in huge quantities in the factories for the nation. So it seems to be a very specialised exclusive job either for the housewives or for the food technologists. Practical training is a thing which must be practiced usually repeatedly, rather than learned theoretically. A surgeon worth the name must operate on patients rather than lecture theoretically how to do it. A ship's surgeon might have to do under very exceptional circumstances but I for myself would not like the idea of being operated under such unusual circumstances.

For this reason, I would like subjects like practical aspects of home science and techniques of food technology to be dealt with as specialization, rather than a general curriculum for general education. However, an over view of the home science and basic rationale and utility of food technology should be incorporated if our school education is to be complete. In this connection the retention of home science as an additional subject for special groups and utilisation of school nutrition programme, vegetable gardenings, etc., as tools for practical nutrition education, if properly implemented could be profitably utilized.

One of the greatest drawbacks of secondary education curriculum appears to be complete omission of the subject of social science. I feel that social science is a subject in which man as a socio-biological unit is considered in the background of its interial eco-system, that is, biology and external eco-systems that is its physics, chemistry: historical and geoggraphical of the diverse lines of learning that attempts to consider the human being and its environment as a whole.

Within the framework of the proposed syllabii it might be possible either (a) to incorporate materials from different subjects at present under such headings, geography, history, biology, etc., or under a separate subject of social science.

Or (b) to have an additional subject of science oriented social science.

Or (c) possibly the best method would be to prepare topic wise curricula irrespective of the different existing disciplines, and to collect and mould all the necessary information on the topic under single headings. This I believe could result in a fundamental and essential improvement in our educational system. The level and depth of information thus integrated could be increased from primary to secondary levels.

Thus, if we want to have a model for the curriculum for nutrition education of the different aspects of the subject, namely, the food, nutrition and dietetics must be integrated despite the fact that the information concerned are by and large at present scattered in books of different subjects like biology (nutrition in many, classes of food, balanced diet, digestion, absorption, transportation and utilization of digested food, general body metabolism), geography (agriculture and agricultural products, population), home science (food hygiene, food requirements, setting of meals) (vide, Indian Certificate of Secondary Education Syllabuses, 1975, published by the Council for Indian School Certificate Examination, New Delhi).

If this type of integrated syllabus providing a wholistic concept of the subject matter is to be accepted it would be of paramount importance to write up topic-oriented monograms which could be collected together to produce books on nutrition education for the school children, for the teachers as well as for the different workers involved in the applied nutrition programme. It appears to me that greatest care and experience is essential for preparation of such curricula and books and the execution of these cannot be let to anybody except exceptionally talented personnels having wide personal experience both at the theoretical and applied aspects.

In organisation of curricu'a and eventual writing of the textbooks, I think great importance should be attached in fixing priorities, emphasis and factual correctness of information. One must bear in mind the apparent poverty even the best used languages and consequence misplacement of priority and emphasis, relevant necessities has been often relegated to the background allowing non-priority matters and information to float up on the top. In India to-day, right in the thick of a socio-cultural-educational crisis we can ill-afford such gamblings of experiments, by any act of omission or commission.

FORMATION OF GENERAL OBJECTIVES AND IDENTIFICATION OF AREAS IN NUTRITION EDUCATION FOR SCHOOLS

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Food is a prime necessity of life. A number of factors affect the acceptibility and utilisation of foods. These include habits, familiarity associations—pleasant or unpleasant, cultural practices and knowledge of relationship to health. Certain foods become symbols for special occasions. A food may be selected because of its association with social status, religious connotation or regional patterns. The quality and kind of foods consumed is largely dependent on economic condition. The most important function of food is that of meeting the nutritional needs of the body.

One of India's most important problem is that of improving the nutrition of her people. This task involves not only the production of more food, but also a better understanding of the relation of food to health, the importance of specific foods, the needs of certain groups of the population and ways of making the best possible use of foods which are available.

Food which contains all the important nutrients needed by the body may not be safe to eat. Wholesome foods are sometimes adulterated by the addition of harmful substances and thus become unsafe.

What is Nutrition and What is the Present Situation

Nutrition can be defined as the science that tells us what nutrients we needs, why we need them and from what it may be obtained.

Nutrition plays a very important role in national development. It ensures healthy population. There is no doubt that only a nation of sturdy people with strength and stamina can face the challenges of modern life successfully. The intellectual and moral progress of a nation also depends upon the physical fitness of its people. Therefore, if our country has to realise its mental and moral potentialities of our people, we must lead a healthy and vigorous life. It is a pity that large number of people in our country are still not nutrition-conscious. There is much ignorance as to what constitutes the balanced diet. Even educated people in high income groups suffer from this ignorance. There is greater emphasise on certain foods to the neglect of others which have even more nutritional value. The self-sufficiency in food grains will not solve the problems of nutrition in this country as nutrition does not mean only the consumption of food. Nutrition is a multi-facet process and involves the interaction of factors like physiological conditions, age and sex, apart from the quantity and quality of food,

Why Nutrition Education

To make the people healthy and nutrition-conscious they need education. Therefore, it is imperative that we should explore ways and means of popularising nutrition education among our people. There is an urgent need to develop progressively a co-ordinated and comprehensive national programme of education and training in applied nurition. Nutrition education should be an integral part of the school curriculum. The need of the house is to incorporate basic information in regard to human nutrition and hygiene into the framework of oud educational curricula so that the younger generations could grow with the basic knowledge they would require later. So there is an urgent need to create awareness for nutrition education through a well-planned educational programme at all stages of education which would enable our students to appreciate the importance of the problem. Intensive efforts are required to launch such a programme. Students in the schools should be told as much as they can assimilate at that age so that they are sufficiently nutrition-conscious.

Nutrition education plays a very important role in diffusing ideas of balanced nutrition and cheap sources of protective foods. Through nutrition education we can raise the status of certain foods and bring them in favour with the people. The programme of nutrition education is very important from two angles. Firstly, upon the health of the children lies the foundation of the future health of nation. Secondly, the children convey their impressions of the schools to their houses, parents which result in spreading the education to the masses.

With the above discussion in view we now come to the objectives of nutrition education.

Suggested Objectives of Nutrition Education

The main objective of nutrition education is to ensure that the students should come to understand **Why** we eat, **What** we should eat and **How** we can get the best value from the foods that are available. This information (and these understandings) should be prevented in such a way that the students then act upon them and improve their eating habits —thus improving the nutritional status of the children.

Objectives

1. *To impart scientific knowledge to the students on the basic principles of nutrition.*
2. To educate the students about the types and quantities of foods that should be consumed.
3. To educate the students about the harmful effects of intoxicants and drug addiction.
4. To help the students to develop hygienic habits.
5. To inculcate in the students good food habits.
6. To help the students to develop desirable nutrition attitudes and behaviours (through the organisation actions).

7. To inculcate in the students skills to handle and prepare food in a proper and hygienic way.
8. To promote among the students a sound and hygienic practice for consumption of right type of foods.

Some Major Areas

1. Personal hygiene.
2. Environmental hygiene.
3. Foods and their sources.
4. Foods and food habits of the people in different regions.
5. Functions of food.
6. Major constituents of diet and their nutrition value.
7. Nutritive value of dirfferent foodstuffs.
8. Food requirements.
9. Balanced diet.
10. School feeding programme and its importance.
11. Food hygiene and food preservation.
12. Storage of foods.
13. Malnutrition and under-nutrition.
14. Elementary knowledge of nutritional deficiences and infections.
15. Awareness about the harmful effects of intoxicants and drug addiction.
16. Kitchen gardening.

Curriculum Development

Subject of nutrition education can be adjusted in the overall framework of the curriculum development. The curriculum should be conceived more in terms of the nature of the learner. In order to do this, one must cease thinking of subject matter as something fixed and ready-made in advance. It should be student-centred type of curriculum. It should be dynamic. All the facts, knowledge, information and subject-matter should became plans of action, ways of responding or reacting.

A NOTE ON SOCIAL PERSPECTIVES IN CURRICULUM OF NUTRITION EDUCATION

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One of the important goals of nutrition education at the school level, as is often envisaged for other sorts of education, ought to be to make it socially worthwhile and relevant. The curriculum in nutrition education can well afford to reckon social needs and it has to be necessarily permeated with a social flavour in developing country like ours. As a sequel to this, one should, while framing a curriculum on nutrition education, keep in view the concept of community that one arrives at through what are called food chain, food web, etc. The curriculum has to have the built-in flexibility that would take care of shifts in attitudes of communities, particularly the rural ones. One can hardly miss the near-ingrained constraints in communities such as traditional beliefs, ecological imbalances, low literacy level, etc. It is perhaps in this way that one builds up a conceptual construct of a meaningful curriculum, in nutrition education. The curriculum envisaged must be sufficiently amenable so as to facilitate its integration with curricula of other subjects. This appears to be a must at the elementary level as a strong motivating factor. Some broad criteria for drawing up a curriculum in nutrition education, besides the usual but substantive considerations of psychology nd pedagogy.

III Objectives of Nutrition Education and Proposed Syllabi

OBJECTIVES OF NUTRITION EDUCATION

Proposed Overall Objectives of Nutrition Education

1. To create an awareness in the individuals, families and communities of the need for adequate nutrition in promoting growth, development and health of children and the well being of all.
2. To impart knowledge about (a) the relationship between food, nutrition, health and hygiene, (b) different foods and their function, (c) food and nutritional requirements and how to fulfil them with obtainable resources and (d) food and population.
3. To contribute to the production of different types of foods within local limitation to the extent possible.
4. To develop skills to select, prepare, serve, consume, conserve and preserve food scientifically.
5. To avoid waste of food at all stages.
6. To foster desirable attitudes and habits towards foods.
7. To understand the nutritional needs of the vulnerable group and the sick.
8. To identify endemic nutritional problems and the efforts taken to overcome them.
9. To identify the hazards related to food additives, adulteration, contamination and pollution.

Proposed General Objectives of Nutrition Education at Different Educational Levels

Primary **schools** (Classes 1–5; Age group 5–9 years.)

1. To help children to become aware of the foods available in the locality.
2. To help children understand the need for food and what food does to them.
3. To help children like eating different groups of foods avoiding waste.
4. To help children form good food habits and hygienic practices.
5. To stimulate the child's participation in food production activities in the home and the school to the extent possible.
6. To help children carry home knowledge of nutrition and its application and teachers to observe and follow up changes in pupils and homes through parent|teacher association and discussion group.

Middle schools (Classes 6, 7 and 8; Age group 10–12 years)

1. To help children explore the availability of different food groups and the possibilities for the inclusion of foods in their daily diet.

2. To help children compare the cost of different foods for daily nutritional needs.
3. To enable children estimate the quantity of different foods to be included in their daily diet within their means.
4. To help children understand the effects of deficiencies in food intake and how to overcome them.
5. To help children raise selected nutritious food groups, poultry, fish and cattle in schools and at homes wherever possible.
6. To help children learn how to assist their families in meeting their food needs, and make the necessary suggestions to improve them.
7. To help children understand the socio-cultural role of foods in their community.

Secondary schools (Classes 9 and 10; Age group 13 and 14 years)

1. To help children to understand the nutritional composition of foods.
2. To help children develop criteria for wise selection of foods.
3. To understand the skills essential in food preparation and preservation to conserve the nutrients and maximise palatability.
4. To understand food and nutrition requirements of different categories of people, age, sex, stage, occupation and health status.
5. To develop abilities to formulate desirable daily diet schedules within and their nutritional implications.
6. *To understand the food customs and habits in different parts of India* and their nutritional implications.
7. To enable the pupils to note signs and symptoms of good and poor nutrition among children and adolescents.
8. To encourage pupils to participate in local community nutrition efforts.
9. To develop awareness regarding different food hazards including food poisoning and adulteration.
10. To stress the relation between nutrition, health and family size.

Teachers' Training Schools and Colleges

1. To create an awareness in the teacher trainees of the vital relationship between nutrition, health and learning abilities.
2. To expose the teacher trainees to the common food and nutritional problems of the community.
3. To enable the teacher trainees obtain an nuderstanding of the principles of nutrition.
4. To help to understand the nutritional needs of people at all age levels and in different situations with particular emphasis on those of children and adolescents.

5. To help the teacner trainees to understand the importance of nutrition as factor in national development.
6. To understand the different possible ways of assessing the nutritional needs of pupil's.
7. To know how to maintain the health record of pupils.
8. To develop skills in the different methods of teaching nutrition.
9. To enable teacher trainees to produce suitable teaching aids for nutrition education.
10. To develop skills in the production, preparation, preservation and conservation of food in the school and community.
11. To enable the teacher trainees develop insights into the problems related to nutrition such as population explosion, income, tradition, food fads, hazards and taboos.
12. To enable teacher trainees to realise their role and participate in the efforts connected with the community for nutritional improvement.
13. To acquire ability to evaluate their nutrition education programmes.

Method masters and science educators

1. To impart an intensive knowledge of the basic principles of nutrition.
2. To understand the staggering dimensions of the effects of malnutrition on national development in terms of learning and working capacities, productivity and stamina.
3. To understand the psycho/socio/cultural implications of malnutrition and the motivation required to impart nutrition education to combat them.
4. To understand all the nutrition education programmes in operation.
5. To develop leadership in implementing the nutrition education programme for schools and training colleges.
6. To develop ability to plan, carry out and evaluate case studies and projects on relationship to alleviation of local nutritional problems.
7. To develop skill's in different methods of teaching nutrition and using teaching aids in nutrition.
8. To develop ability to write and present reports and literature pertaining to nutrition.

Proposed Syllabus of Nutrition Education : Primary level

Major Concepts	*Contents*	*Activities*
1	2	3
I. Objective : To help children to become aware of the foods available in the locality.		
1. Different food groups	1. Cereals, pulses, etc. (in ICMR special report series no. 42). 2. Name and appearance of the foods.	1. Observe foods at home and make models (1) 2. Identify through models and actual specimens (I) 3. Observe foods sold in the market (II) 4. Visits to orchards and farms (II) 5. Drawing, painting, and colouring pictures of food (II) 6. Clay modelling (II to V) 7. Songs and nursery rhymes (I & II) 8. Food games (III to V) 9. Domestication (III to V)
II. Objective : To help children understand the need for food and what food does to them.		
1. Functions of different food groups.	1. Energy giving, body building and growth promoting and protective and regulating functions.	1. Observing growth of animals, birds, young plants, fish and small children (I & II) 2. Grouping of foods, models or pictures according to functions (through flannel graph) (I) 3. Listing the foods needed for energy expenditure to correlate with energy giving foods (III) 4. Songs, drama and role playing (I & II) 5. Food alphabet (I & II) 6. Identifying the foods in the school meal (I to V) 7. Matching games (III to V) 8. List signs of growth, *e.g.*, clothes becoming tighter.

<table>
<tr><th>1</th><th>2</th><th>3</th></tr>
<tr><td colspan="3">III. Objective : To help children to like eating different groups of foods avoiding waste.</td></tr>
<tr><td>1. Need to eat foods from each group every day
2. To learn to enjoy food
3. To learn and avoid wasting foods</td><td>1. Ingredients of daily diet and identifying foods they have eaten at home.
2. Factors which help to enjoy food : appearance, comfortable seating, quantity, texture, temperature, cleanliness, smell, company and availability of water.
3. Reasons for wasting food and need to avoid waste unattractive food, not cooked properly, flavour unfamiliarity, habits and emotional reasons.
4. Needs for avoiding waste at individual and national level.</td><td>1. Recalling foods taken on previous day and classifying according to groups (II to V)
2. List the food they enjoy most and the reasons (II to V)
3. Role playing to stress the need for essential foods e.g., dal and green leafy vegetables (II to V)
4. Songs and stories on foods.
5. Dramaties food waste.
6. Reading, writing and arithmetic on food waste (IV &amp; V).
7. Display of foods showing wastage through posters (I to V).</td></tr>
<tr><td colspan="3">IV. Objective : To help children to form good food habits and hygienic practices.</td></tr>
<tr><td>1. What are good food habits.
2. Inculcation of good food habits.
3. Need to observe hygienic practices in food handling and intake.</td><td>1. Regularity of meals and avoiding eating in between meals.
2. Explanation of good food habits, regularity, cleanliness, cheerfulness and adequacy of meals.
3. Practising the above at school and home.</td><td>1. Washing hands before meals (I to V)
2. Eating without spilling and wasting (I to V)
3. Being cheerful during meals (I to V)
4. Proper chewing and avoiding rushing through meals (I to V)
5. Eating adequate quantities (I to V)
6. Eating in clean surroundings (I to V)
7. Washing hands and mouth before and after meals by using soap (I to V)
8. Proper disposal of wrappers, leaves and peels (I to V)
9. Control of flies and dirts in eating place (I to V)
10. Observing the meal times in the family (III to V)</td></tr>
</table>

1	2	3
		11. Observing timings of school meals (III to V) 12. Discussion of regularity in the taking of meals. 13. Demonstration of eating without spilling (II to V) 14. Visual aids like postage demonstrating the above (I to V) 15. Songs, game, dramatisation (I to II) 16. Reading, writing and arithmetic on food waste (III to V) 17. Display of food wastage through posters (I to V) 18. Use of clean drinking water (I to V) 19. Use of clean plates and tumblers (I to V)

V. Objective : To stimulate the child's participation in food production activities at home and in the school to the extent possible.

1. Need for additional food production	1. Types of activities in which children can participate like gardening, poultry raising, etc.	1. Cultivation of school garden, and kitchen garden (I to V) 2. Assessing the production in the garden over a period, and classifying the foods according to food groups (III to V) 3. Inclusion of the food produced in the school garden in the school meals (I to V)

VI. Objective : To help children to get a carry home knowledge of nutrition and its applications, and teachers to observe the following changes in pupils through Parent/Teacher Association and discussion groups)*

The matter in parenthesis was added to the 6th objective. As this concerns behavioural change, it cannot be speltout into *contents and activities.

Proposed Syllabus of Nutrition Education : Middle School Level (Classes VI—VIII)

Major concepts	*Contents*	*Activities*
1	2	3

I. Objective : To enable children estimate the quantities of different foods to be included in their daily diet within their means

II. Objective : To help children compare the cost of different foods to fulfil their nutritional needs within their means

1. Daily caloric and nutritional requirements in different categories of individuals and families	1. Nutritional requirements of children and adolescents of different age groups and sex, adults in different occupation and stages.	1. Tabulating the nutritional requirements of various categories.
2. Nutritive value of different foods	2. Nutritive value of the important foods in different food groups	2. Tabulating one's daily nutritional requirement.
3. Cost	3. Seasonal foods and their cost	3. Calculating the quantities of food required to meet one's nutritional needs.
4. Cost of the additional food required to fulfil their daily needs	4. Foods to be included to balance the home diet and their cost	4. Calculating the cost of quantities of food required.
		5. Calculating the daily caloric and nutrient intake.
		6. The gaps in food intake.
		7. Cost of additional food required.

III. Objective : To help children understand what balanced diet means (All for standard VIII)

1. Food is composed of different nutrients.	1. Definition of calorie in human nutrition ; contributors of calories in diet (CHO, proteins and fat).	1. Let the children list the activities which need energy.
2. Concept of caloric and nutrient values in food.	2. Need for calories—metabolism, basal metabolism and activities.	2. Draw the activities or collect suitable pictures to describe each activity.
3. Definition of balanced diet.	3. Different nutrients and their functions. Foods rich in different nutrients.	3. Group foods according to caloric value using pictures and models.

1	2	3
	4. Balanced diet is one that is balanced in quantity and quality of foods as measured by calorie and nutrients.	4. Group foods according to protein, Ca, Fe, Vit. A, etc.
		5. Listing of food with quantities for balanced diet.

IV. Objective : To help children to explore the availability of different food groups and the possibilities of their inclusion in the daily diet.

1. Food habits of the locality.	1. Different categories of people follow different food patterns (VI).	1. Survey of the food groups used in the home diet (VI).
2. Food available in the locality.	2. Seasonally available foods (VI).	2. —do— produced in the locality
3. Capacity to purchase the essential foods.	3. The cost of food (VII).	3. Survey of the food groups consumed at homes and schools (VI).
4. Foods to be additionally included in the diet.	4. Food budget in the families of the pupils (VII).	4. Survey of the foods available in the market during the seasons.
	5. Food gaps in the diets of the children (VII).	5. Finding out the cost of different foods during different seasons (VII). 6. Comparing the cost of the different foods of the same groups (VII). 7. Finding out of the expenditure on food at home on different food groups (VII). 8. Locating the minimising food groups in the home diet (VII). 9. Identifying the food to be added to the home diet (VII).

V. Objective : To help children to understand the effects of "deficiencies" in food intake and how to overcome them (VIII).

1. Effects of calorie deficiencies and imbalance effects of over nutrition.	1. Definition of "undernutrition", "overnutrition" and "malnutrition".	1. Compare the heights and weights of children in the class (ICMR stds.).

1	2	3
2. Improvements needed in caloric and nutritional intake.	2. Consequences of undernutrition—retardation of growth, reduction in capacity for work, fatigue and physical weakness.	2. Observation of different types of children community; listing and classifying the children according to their activities in the community.
	3. Consequences of "overnutrition", obesity.	3. Helping children observe deficiency symptoms such as bile spots, rickets, angular stomatitis, rough skin, etc.
	4. Consequences of deficiencies of protein, CHO, fat, vitamin A and C, B-complex.	4. Show posters, slides, films, charts, pictures, etc.
	5. Sign and symptoms of malnutrition.	

VI. Objective : To help children select nutritious foods, crops, poultry, etc.

1. Need to augment food production.	1. Role of protective foods and increasing their production through kitchen and school gardens.	1. Raising school garden.
		2. Raising kitchen garden, utilising the services available locally, with green leafy vegetables, papaya, guava.
		3. Where possible, raising poultry, fish etc.
		4. Assessing the monetary and nutritive values of the food products.
		5. Use of foods produced in school meals and assessing their impact on the health of the pupils.

VII. Objective : Periodic evaluation of the changes made to improve their individual nutrition in the family as seen at lunch.

VIII. Objective : Through observations and assignments, the foods used or avoided on special occasion such as festivals, ceremonies and special stages in the development.

IV Annexures

Annexure-I

List of Participants

1. Dr. (Smt.) Devadas, Rajammal P.
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2. Dr. A. K. Sen,
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Annexure II

PROGRAMME

	10·00—Registration	**Venue**—Auditorium, Indian Institute of Chemical Engineering, Jadavpur University, Jadavpur.
15th October, 1974	11.00—Inauguration :	**Welcome Address**—Prof. Sunit Mukherjee (Jadavpur) Local Director. **Functions of NCERT**—Prof. A.N. Bose, Head, DESM, NCERT, New Delhi. **Aims and Targets of NCERT**—Prof. B. Ganguly. Director, National Seminar, Nutrition Education. **Inaugural address**—Prof. A.N. Bose, Vice-chancellor, Jadavpur University, Jadavpur. **Presidential address**—Prof. Dr. Sachchidananda Banerjee, Calcutta. **Remarks from participants**—Dr. (Smt.) R. Devadas (Coimbatore) Dr. Amita Bose (Calcutta). **Vote of thanks**—Km. S. Mazumdar, NCERT, New Delhi.
	12.30—	General Session I—Discussion on the mechanism of work and appointment of chairmen and recorders of different sessions. Chairman—Dr. R.P. Devadas (Coimbatore) Recorders—Km. S. Mazumdar (NCERT, New Delhi) Mr. D.R. Chowdhuri (Jadavpur)
	13.00—	Lunch
	14.15—	Special Lecture : Emphasis of projects on Research Methodology and Community Education, Smt. L. Krishnamurthy, CARE, New Delhi.
	15·15—	Tea.
	15.30—	General Session II : Reading of papers and discussion—Area I ; Major issues in the field of Nutrition education. Chairman—Mr. Rajat Mitra (Bombay) Reporter—Km. A. Singh (New Delhi) Speakers—Prof. S. Mukherjee (Jadavpur) Dr. A.K. Sen (New Delhi)
	16.30	Break for the Day.
16th Oct. 1974	9.30	General Session III : Report of the previous day's work.

	10.00	General Session IV—Reading of papers and discussion—Area II : Nutrition education in developed countries.
		Chairman—Smt. Sarojini Dastur (Mysore)
		Reporter—Dr. S. Adhikari (Calcutta)
		Speakers—Dr. B. Ganguly (New Delhi) Dr. A.K. Sen (New Delhi)
	11.15	Tea.
	11.30	General Session V : Reading of papers and discussion—Area III : Nutrition education in developing countries.
		Chairman—Smt. Parvathi Rao (Hyderabad)
		Recorder—Mr. D.A. Verma (New Delhi)
		Speaker—Mr. R. Mitra (Bombay)
	13.00	Lunch.
	14.15	Special lecture : Science in Primary schools and nutrition education.
		Km. S. Mazumdar (NCERT, New Delhi)
	15.15	Tea.
	15.30	General Session VI : Reading of papers and discussion—Area IV : Appraisal of nutrition education programme in India.
		Chairman—Mr. P. Rao (Hyderabad)
		Reporter—Mr. D.H. Verma (New Delhi)
		Speaker—Dr. P.K. Dutta (Calcutta)
	16.30	Break for the day.
17th Oct. 1974	9.30	General Session VII ; Report of previous day's work.
	10.00	General Session VIII : Reading of papers and discussion—Area V : Nutrition education in School: present position and future profile.
		Chairman—Smt. R.P. Devadas (Coimbatore)
		Reporter—Dr. J. Mitra (Calcutta)

		Speakers—Smt. Parvathi Rao (Hyderabad) Dr. D.N. Ganguly (Calcutta) Mr. S.K. Sur (Calcutta)
	11.15	Tea.
	11.30	General Session IX : Reading of papers—Area VI : Nutrition Education in Training Colleges ; present position and future profile. Chairman—Km. M. Adhikari (Calcutta) Reporter—Smt. S. Dastur (Mysore) Speakers—Smt. R.P. Devadas (Coimbatore) Smt. B. Sen. (Calcutta) Dr. P. Sengupta (Ex. FAO)
	13.00	Lunch.
	14.15	Special Lecture : Nutrition and infection Dr. K.L. Mukherjee (Calcutta)
	15.15	Tea.
	15·30	General Session X : Reading of papers—Area VIII. Interactions of home, society and schools in implementing nutrition education programme. Chairman—Smt. B. Sen (Calcutta) Reporter—Dr. I. Ghosh (Calcutta) Speaker—Km. K. Sawhney (New Delhi)
	16.30	Break for the day.
18th Oct. 1974	9.30	General Session XI : Report of the previous day's work
	10.30	Special lecture : Planning of the nutrition education in the country—Dr. A.K. Bose (Calcutta)